

36778

**FOCUSED
REMEDIAL INVESTIGATION
ASBESTOS DUMP SITES
NEW VERNON ROAD SITE
MORRIS COUNTY, NEW JERSEY**

FINAL REPORT

Prepared for:

U.S. Environmental Protection Agency

Contract No.: 68-W9-0003

Work Assignment No.: C02077

TES 6



ALLIANCE
Technologies Corporation

ABD 001 1451 F

**NEW VERNON ROAD SITE
MEYERSVILLE, NJ
FINAL FOCUSED REMEDIAL INVESTIGATION REPORT**

Prepared for

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Emergency and Remedial Response Division
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NOTE:

This Focused Remedial Investigation (Focused RI) report is a compilation of all previously conducted investigations into the nature and extent of contamination at the New Vernon Road property. The scope of this RI report includes data collection on the physical characteristics of the site and surrounding areas, the nature and extent of contaminant sources, and the nature and extent of contamination. The RI has been focused by addressing the contamination with asbestos containing materials as its principal objective. Contaminant fate and transport, and a baseline risk assessment were not included in the scope of this Focused RI. However, a baseline risk assessment has been performed by EPA and will be available in the administrative record for the site, as a separate document.

1.0 INTRODUCTION

1.1 Purpose of Report

The purpose of this report is to compile all existing data that has been generated during previous investigations and to subsequently delineate the nature and extent of contamination at the New Vernon Road Site. As instructed by EPA, the main objective of this Focused Remedial Investigation effort is to characterize the locations and occurrence of asbestos contamination at the site. The Focused Remedial Investigation also presents additional data originally reported in the National Gypsum Corporation (National Gypsum) 1987 RI Report.

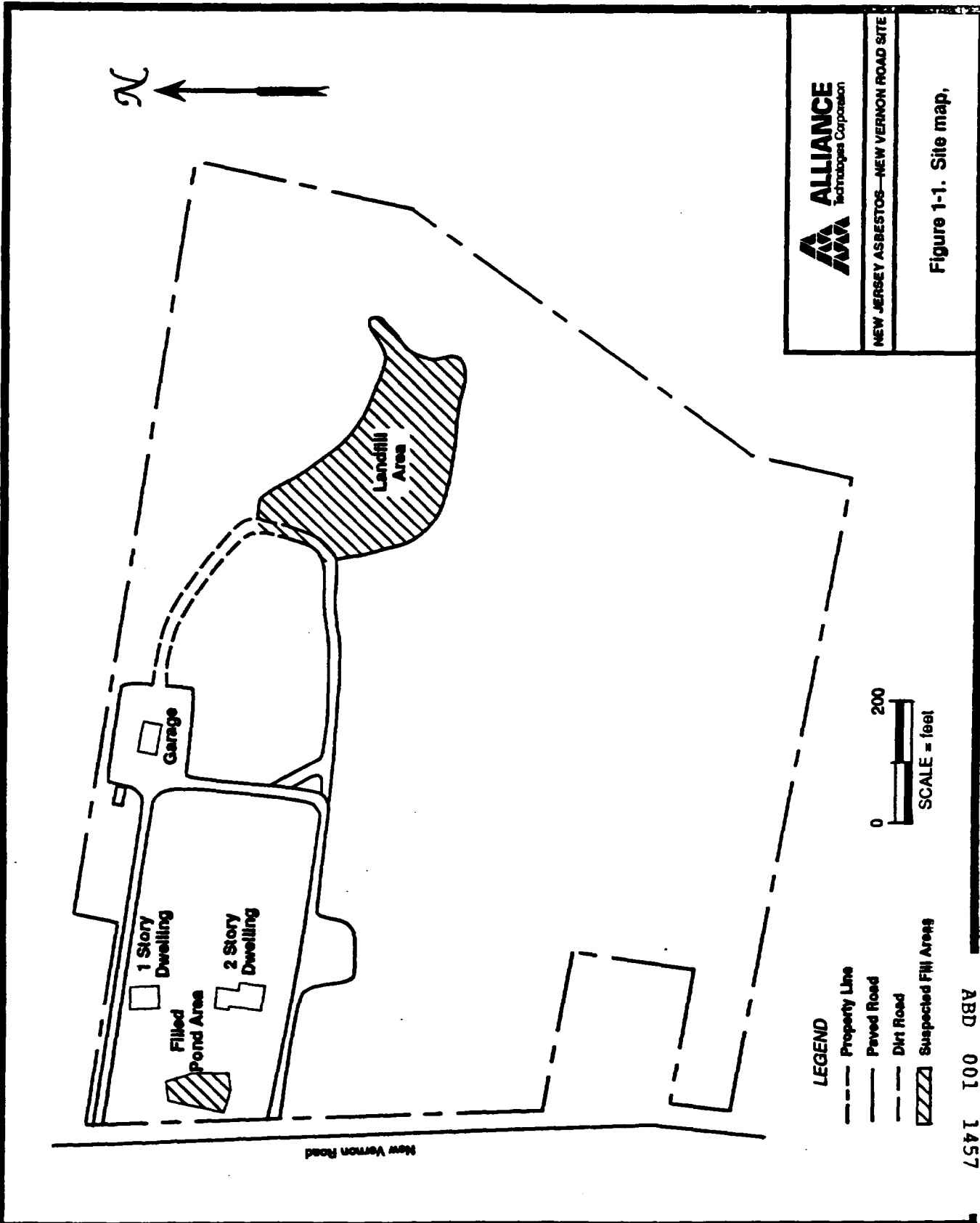
1.2 Site Background

The Asbestos Dump Site is a National Priority List Site in the EPA National Superfund Program. The Asbestos Dump Site includes four separate properties all of which are located next to or close by the former National Gypsum Plant in southeastern Morris County, New Jersey. These four properties include the Millington Site (where the former National Gypsum Plant was located), the Dietzman Tract, the New Vernon Road Site and the White Bridge Road Site. These latter three sites are collectively referred to as the satellite sites. These sites are not related except for the fact that at one time they all received asbestos containing materials from the National Gypsum Plant. Currently, the Asbestos Dump project is divided into three operable units. A Record of Decision (ROD) for the first operable unit, the Millington Site, was signed on September 30, 1988. Negotiations for implementation of the remedial action were unsuccessful and EPA issued a unilateral order to the potentially responsible party (PRP), National Gypsum. National Gypsum is currently conducting a remedial design for this operable unit. The properties of the second operable unit, the New Vernon Road and White Bridge Road sites are the subject of these Focused Remedial Investigation efforts. The New Vernon Road site is discussed in this Focused Remedial Investigation. The third operable unit, the Dietzman Tract, will not be discussed under this Work Assignment.

1.2.1 Site Description

The New Vernon Road Property consists of approximately 30 acres of land located at 237 and 257 New Vernon Road in Meyersville, New Jersey. This property is bounded by a portion of Great Swamp to the north, tracts of wooded and wetland areas to the east and south, and New Vernon Road to the west (see Figure 1-1). There is one residence located onsite. One private residence is located directly south of the property; another residence is located southwest of the property to the south of a tennis court. Both residences are located on the opposite side of New Vernon Road.

A driveway, paved in the fall of 1990, as part of EPA's removal action begins at New Vernon Road to the direct south of the two story dwelling located in the northwestern portion of the property. The portion of this driveway extending to the landfill areas was asphalted; the remainder of this road was covered with a geotextile fabric. The driveway extends east past the dwelling for approximately 1,000 feet into an open area. This area, reportedly the



NEW JERSEY ASBESTOS—NEW VERNON ROAD SITE

Figure 1-1. Site map,

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main landfill, is approximately 200 to 300 feet in length and is cluttered with tree debris. Prior to reaching the open area, a driveway extends north for approximately 200 feet to a tree servicing business. The tree servicing business is owned and operated by the owner of the property and consists of several large trucks and a two story building. A driveway located in the northwest corner of the property provides access to this business.

1.2.2 Chronology of Events

From 1945 through 1980, the property was used for farming (i.e., corn and dairy cattle). For a period of two years during the late 1960's, refuse from National Gypsum was disposed in two areas. Initially, this refuse which included asbestos fibers, broken asbestos tiles and siding, was disposed of in a small depression in the westernmost section of the property. Land disposal then took place toward the central portion of the property in a larger depression (i.e., main landfill area).

During 1980, asbestos was observed in the various soil and grassy areas throughout the property. Consequently, the property was graded and seeded after being purchased in 1980 by the current residents.

1.2.2.1 Previous Investigations

During 1987, National Gypsum completed a Remedial Investigation (RI) of the asbestos dump sites, Morris County, New Jersey. Results of this RI are included in a RI Report which was prepared by Fred C. Hart Associates, Inc., (Draft Report dated May 29, 1987). As discussed in Section 1.2 of this report, this RI Report focused on four asbestos disposal sites, one of which was the New Vernon Road Site. This report can be accessed by the public at a repository at Passaic Township Hall, 1802 Long Hill Road, Millington, New Jersey.

As stated in the National Gypsum RI Report, the purpose of the investigation was to define the presence and extent of asbestos and other contaminants of concern, if any, at the sites and to evaluate potential impacts of these contaminants to public health and the environment. The RI included a hydrogeological investigation and involved the sampling and subsequent laboratory analysis of subsurface soil, sediments, surface water, ground water, potable water and air. A limited number of samples from these different environmental media were analyzed for asbestos, volatile organics, base neutrals, phenols, pesticides/PCBs, metals and cyanide. The RI was complete for Millington, but did not adequately characterize New Vernon Road, White Bridge Road or Dietzman Tract properties. Results from this investigation for the New Vernon Road property are presented in Section 2.0 of this report.

During March and June 1990, representatives from EPA's Removal Action Branch (RAB), Emergency Response Team (ERT), and Fish and Wildlife Service (FWS) conducted site visits to collect information for a removal assessment at the property.

On August 2, 1990, based on recommendations from ERT representatives, sampling was conducted at the property. RAB collected surface soil samples from the surface of the

driveway and the floor of a shed located on site. A single dust sample was collected from the current resident's vacuum cleaner bag. On August 24, 1990, ERT collected a dust sample from inside the house located on the property. All samples were analyzed by transmission electron microscopy (TEM) for types of asbestos fibers and percent asbestos. ERT's dust sample was analyzed by both Polarized Light Microscopy (PLM) and TEM methods. Sampling results indicated that two to five percent chrysotile asbestos were present in all samples.

After reviewing the data, the Agency for Toxic Substance and Disease Registry (ATSDR) determined the site posed an immediate and substantial health threat to the residents and recommended temporary relocation of the residents on the site until the threat could be remediated. The residents at the site were not receptive to relocating.

From September to November 1990, removal actions were conducted at the site. Additional work during this investigative effort included the following: (1) the gravel drive containing asbestos chips was asphalted; (2) the dilapidated shed which contained a fragmented asbestos floor was dismantled and disposed of in the landfill area; (3) the house, apartment and garage were decontaminated by EPA by vacuuming and wet wiping. Air samples were collected and analyzed to verify clean-up levels; (4) the asbestos chips located at the surface were systematically collected and bagged; (5) the dirt floor from the dilapidated shed and the road which contained asbestos tiles were covered with geotextile fabric to restrict access and to reduce the potential for airborne releases; and (6) signs and a temporary fence were erected to restrict access into areas suspected to contain high levels of surficial contamination.

In (3) above, the sampling was a result of consultation between EPA Region II, ATSDR and ERT. Sampling was performed on October 16, 1990 and again on October 23 after the decontamination process had been completed. Samples were collected at a flow rate of approximately 12 liters per minute for a 14 hour period (10,000 liters were collected). Analysis of the samples were performed utilizing TEM following sampling method NIOSH Method 7402. All samples, after the residence was decontaminated by vacuuming and wet wiping, contained asbestos concentrations below the method detection limit of 1.0 percent (by weight).

During October and November, 1990, Alliance conducted a field sampling and analysis program for EPA which consisted of several tasks including: a site survey, a geophysical investigation (i.e., ground penetrating radar [GPR]), soil and air sampling and subsequent analyses of samples for asbestos. Results of this investigation are summarized in Section 2.0 of this report. A detailed report of this field sampling is included in Alliance's Final Field Sampling and Analysis Report, NJ Asbestos Dump Site, New Vernon Road Site, Meyersville, New Jersey (Alliance 1991).

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2.0 NATURE AND EXTENT OF CONTAMINATION

The purpose of this section is to present information on the occurrence and distribution of chemical constituents found at the New Vernon Road property (the site). Data for this section were obtained from the following documents:

- Final Field Sampling and Analysis Report, NJ Asbestos Dump Site, New Vernon Road, Meyersville, New Jersey. Prepared by Alliance Technologies Corporation, May 1991.
- Draft RI Report, Asbestos Disposal Sites, Morris County, New Jersey. Prepared by Fred C. Hart Associates, Inc. for National Gypsum Corporation, May 1987.

This section is divided into two subsections. The nature and extent of all non asbestos constituents are discussed in Section 2.1. The occurrence and distribution of asbestos is discussed in Section 2.2.

The New Vernon Road property is located within the north-central area of the Piedmont Physiographic Province. This province is made up of the Newark Supergroup Deposits of the Newark Basin, which is one of many Newark Supergroup Basins that parallel the appalachians along the east coast of North America. Geology at the site consists of a number of unconsolidated sedimentary deposits that underlie the site in various thicknesses. The existence and spatial distribution of these deposits are typical of glacial and swamp deposits that are present throughout the region. Geologic information about the site was obtained from the National Gypsum RI Report and was only available for the upper 12-15 feet of the site. Site specific geologic information and ground water information is limited because it was obtained from the advancement of only three test borings. A total of the five geologic units were identified.

The uppermost deposit consists of a topsoil layer that varies from four to seven inches thick. In some areas of the site, asbestos fill material underlies this topsoil horizon. Thicknesses and exact locations of these asbestos fill areas is discussed in Section 2.2 of this report. Underlying the asbestos fill is a deposit of sandy clay. This sand clay deposit does not exist under all areas that were investigated. The deposit is most extensive at the eastern edge of the site where it is approximately three feet thick. A sandy unit lies stratigraphically below the sandy clay. This sand unit underlies the entire area that was investigated and ranges in thickness from 1.5 feet in the southwest region of the site to approximately seven feet in thickness in the northern region of the site. Underlying the sandy unit is a deposit of brown sandy clay. This unit does not exist under all areas that were investigated and is most extensive in the southwest region of the site where it is approximately 8.5 feet thick.

The site lies within the central basin region of the Passaic River drainage basin. Ground water under the site is relatively shallow, ranging from one to five feet from the surface. Therefore, the vadose zone is generally limited to a shallow layer of the subsurface near the surface.

Because this unconfined upper water-bearing unit lies so close to the surface, asbestos fill is generally located in the saturated zone. Ground water flow direction is believed to be flowing from the southwest to the northeast at an extremely low gradient of approximately 0.002.

Hydraulic conductivity values determined from pump test data obtained during the National Gypsum RI ranged from 0.21 to 19.8 feet per day. The range of variation was due to the different lithologies of the screened water-bearing units. The average of these measurements, 7.0 feet per day was utilized in assessing the discharge velocity of 5.11 feet per year. Estimates of the effective porosity were difficult to determine due to the heterogeneous composition of the water-bearing unit. Conservative values ranging from 15 to 30 percent were utilized and produced estimated velocity values of 17 to 34 feet per year.

The New Vernon Road Site is bordered by the Great Swamp National Wildlife Refuge to the northeast. Consequently, property that is located along the southern and eastern boundaries of the site contain standing water. The northern and western sections of the site are topographically higher and are relatively dry. From analysis of a site survey map (see the foldout map in the back of this report), it is estimated that this site contains approximately 35 percent wetlands. This wetland area is located in the southern and eastern regions of the site.

2.1 Non Asbestos

Data regarding non asbestos contamination at the site were obtained during field investigation activities performed by Hart for National Gypsum from August 1986 to February 1987.

Field investigation activities included the collection and subsequent analysis of three subsurface soil samples (test borings), two sediment samples, two surface water samples, three ground water samples, three domestic well water samples, and three outdoor air samples. The air samples were analyzed for asbestos content only and are discussed in Section 2.2.

2.1.1 Data Quality

All of the samples collected during the National Gypsum RI, except for the air samples, were analyzed for priority pollutants plus 40 parameters. This procedure was used to tentatively identify the 15 highest volatile organic fraction peaks, the 10 highest acid extractable organic peaks, and the 15 highest base/neutral organic peaks.

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Alliance has noted the following data quality issues that must be considered when the 1987 data is interpreted. These data quality issues were identified by reviewing National Gypsum RI data quality procedures for consistency with EPA Region II CERCLA Quality Assurance Manual, Revision 1, October 1989. These issues include:

- There is limited discussion regarding data validation in the National Gypsum RI Report. No section in the report specifically states the validation procedures used. Consequently, information regarding data quality is limited. Alliance concludes that analytical data generated during the RI was evaluated but not validated in accordance with all EPA Region II technical evaluation procedures.
- Pursuant to the *Region II, CERCLA Quality Assurance Manual, Revision 1* (October 1989), rinse blanks should be performed for all analytes of interest and should be collected for each type of equipment used each day a decontamination event is carried out. In the National Gypsum RI Report rinse blanks were collected during the field investigation activities performed at the four asbestos subsites. However, the RI Report does not distinguish which rinse blanks were taken at which asbestos subsites. When discussing the data in the RI Report, all analytical data for all four sites were grouped together. Therefore, it is not clear if rinse blanks were performed at the New Vernon Road Site. In discussions that follow, all analytical data from all rinse blanks which are presented in the National Gypsum RI Report are included in this report although, it is not clear from which asbestos subsite a particular rinse blank was collected.
- Analytical results from trip and laboratory blanks indicate detectable levels of volatile organics, base neutrals, phenols and metals. Pursuant to CLP Organics Data Review and Preliminary Review, SOP No. HW-6, Revision #7, March 1990, and Evaluation of Metals for the Contract Laboratory Program (CLP), SOP No. HW-2, Revision X, February 1990, the following procedures should be followed when validating and reporting data if analytes are found in laboratory, rinse or field blanks:
 - Action levels for all common laboratory contaminants (methylene chloride, acetone, toluene, 2-butanone, and phthalates, only) should be set at 10 times the highest blank concentration for that analyte.
 - All other action levels for analytes detected in laboratory, rinse or field blanks should be set at 5 times the highest blank concentration for that analyte.
 - If concentration levels in field samples are above the Contractually Required Quantitation Limits (CRQLs) but below these action levels, mentioned above, field samples which would be flagged with a "B" (analyte was found in the blank as well as the sample) should be

flagged with a "U" (analyte not detected). These analytes flagged as a "U" should be considered non detect values and should not be included when discussing the data. In the National Gypsum RI Report, this procedure was not performed.

- If contamination levels in field samples are above these action levels, mentioned above, contaminations levels should be treated as valid concentrations.

There is some suggestion in the National Gypsum RI Report that procedures similar to the "10X and 5X rule", as described above, were used, but no data was flagged with a "U" and subsequently screened out. It is important to note that the end result of extensive field contamination during the 1987 RI is that action levels for analyses would be significantly higher than the CRQLs. The elevated action levels adversely impact data useability, since many risk-based numerical standards and criteria are below these action levels that would be reported if the 10X and 5X rules were applied.

In the discussion that follows, analytical data generated from the National Gypsum RI Report are used even though this data has not been properly validated pursuant to EPA Region II guidelines.

2.1.2 Subsurface Soil (test borings)

A total of four subsurface soil samples were analyzed from the New Vernon Road Site, two from test boring NVR2 (Sample No. 7 and 8) and two from test boring NVR3 (Sample No. 12 and 13). Sample No. 13 was a duplicate of Sample No. 12. Sample No. 7 and Sample No. 8 were collected at different depths from test boring NVR2. Specific collection depths of these samples are not included in the National Gypsum RI report. The National Gypsum RI states that all test boring samples that were submitted for laboratory analysis were recovered from the natural swamp deposits that underlie the asbestos fill. No site specific metals background sample was taken at the New Vernon Road property. Table 2-1 presents a summary of priority pollutant data for these samples. This table was taken from the National Gypsum RI Report and indicates from the flags designated as "B" in some of the analytes, that some of the analytes were found in the laboratory blank as well as the sample. Analytical data from this laboratory blank is not presented in the National Gypsum RI Report. In addition, there is no indication that rinse or field blanks were taken while obtaining subsurface soil samples at the New Vernon Road property. As discussed in Section 2.1.1, this is not in compliance with EPA Region II sample collection procedures. Test boring/monitoring well locations are presented in Figure 2-1.

The organic data consists of the detection of some volatile organics and a few base neutral compounds. A total of nine volatile organic compounds were detected. Methylene chloride (14 - 20 ug/kg), chloroform (4 - 13 ug/kg) and toluene (4 - 7 ug/kg), were present in all four soil samples. Estimated concentrations of trichlorofluoromethane (1 - 2 ug/kg) and chlorobenzene (1-2 ug/kg) were present in soil samples 7 and 12, respectively. In addition,

**TABLE 2-1. SUMMARY OF PRIORITY POLLUTANT DATA
NEW VERNON ROAD SITE
TEST BORING SAMPLES**

	Sample Number			
	NVR2		NVR3	
	7	8	12	13**
Volatile Organics (ug/kg)				
Methylene Chloride	20B	14B	19B	19B
Trichlorofluoromethane	2J	---	1JB	---
Chloroform	13B	4JB	6B	12JB
1,1,1-trichloroethene	---	---	2JB	---
Benzene	---	---	1JB	---
1,1,2,2-Tetrachlorethane	---	---	3JB	---
Toluene	6B	4JB	7B	4JB
Chlorobenzene	1J	---	2JB	---
Ethyl Benzene	---	---	2JB	---
Base Neutrals (ug/kg)				
Naphthalene	6J	---	---	---
Diethyl phthalate	---	---	---	45J
Phenanthrene	13J	---	---	---
Di-n-butyl phthalate	---	34JB	---	---
Metals (mg/kg)				
Chromium	13.5	27.5	27.9	32.4
Copper	8.0*	30.4*	25.1	30.0*
Lead	18.1R	8.10R	4.97R	21.2R
Nickel	9.34*	25.6*	24.1*	34.2*
Zinc	16.6	59.1	57.0	78.8

-- Indicates compound was analyzed for but not detected.

J Indicates that the compound was analyzed for and determined to be present in the sample. The mass spectrum of the compound meets the identification criteria of the method. The concentration listed is an estimated value, which is less than the specified minimum lower limit but is greater than zero.

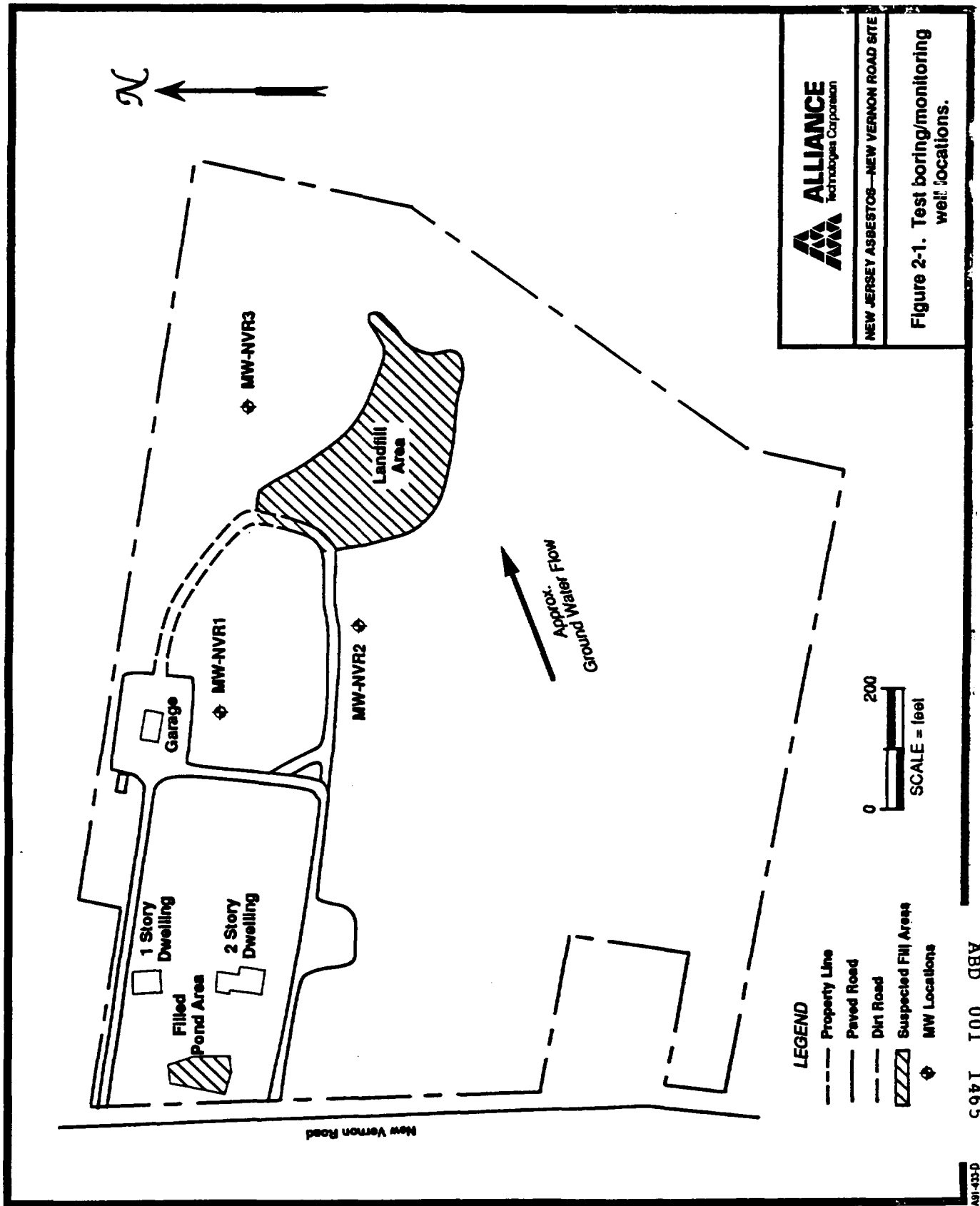
B Analyte was found in the method blank as well as in the sample.

* Indicates duplicate analysis is not within control limits.

R Indicates spike sample recovery is not within control limits.

** Sample 13 is a duplicate of sample 12.

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the following volatile organics were detected in test boring NVR3, sample 12:

1,1,1-trichloroethane (2 ug/kg); benzene (1 ug/kg); 1,1,2,2-tetrachloroethane (3 ug/kg) and ethyl benzene (2 ug/kg). A total of four base neutrals were detected. Naphthalene (6 ug/kg), and phenanthrene (13 ug/kg), were present in soil sample 7; diethyl phthalate (45 ug/kg) in soil sample 13 but not in sample 12, the duplicate; and di-n-butyl phthalate (34 ug/kg) in soil sample 8.

Five metals were detected in the soil samples at concentrations ranging from 4.97 to 78.8 mg/kg. The total range of concentrations for the metals were chromium (13.5 - 32.4 mg/kg); nickel (9.34 - 34.2 mg/kg); copper (8.0 - 30.4); lead (4.97 - 21.2 mg/kg); and zinc (16.6 - 78.8 mg/kg). The above concentrations were compared to common ranges of naturally occurring elements which are found in soils. This data, which is presented in Table 2-2, was obtained from EPA, Solid Waste and Emergency Response, *Hazardous Waste Land Treatment*, SW-874, April 1983. The above concentrations fall within the range of standard background levels in natural soils.

2.1.3 Sediment Samples

Two sediment samples (SED-13 and SED-14) were collected in proximity to the New Vernon Road Site. SED-14 was collected in a drainage ditch located upgradient from the site. SED-13 was collected in a drainage ditch located downgradient from the site. Specific locations of these samples are not included in the National Gypsum RI Report. Sediments consisted of a brown silt and sand with much organics (SED-13) and a sandy silt with brown organic matter (SED-14). Analytical results of these sediment samples along with field blanks and trip blanks are presented in Table 2-3. All field blanks and trip blanks taken during sediment sampling activities are presented in this table because National Gypsum does not distinguish in the RI Report which blanks were taken at which asbestos subsite. When discussing the data in their report, all analytical data for all four sites were grouped together. In addition, as indicated from the flags designated as "B", some constituents were present in a laboratory blank. Analytical results from this blank were not presented in the National Gypsum RI Report. Surface water/sediment samples were collected from the same location and are presented in Figure 2-2.

In the organic fraction of the priority pollutants, three volatile organics (methylene chloride, chloroform and toluene) and seven base neutrals (naphthalene, diethyl phthalate, phenanthrene, fluoranthene, pyrene, benzo(b)fluoranthene and benzo(a)pyrene) were found in detectable levels. In addition, SED-14 contained a phenols concentration and SED-13 contained an elevated level of beta-BHC, which is a pesticide.

Volatile organics detected in SED-13 and SED-14 are as follows: methylene chloride (2 and 3 ug/kg); chloroform (3 and 5 ug/kg) and toluene (2 and 3 ug/kg). In addition, methylene chloride (4-6 ug/kg) was detected in the field and trip blanks.



TABLE 2-2. TRACE CHEMICAL ELEMENT CONTENT OF NATURAL SOILS

Element	Common Range (ppm)	Average Range (ppm)
Antimony	2-10	---
Arsenic	1-50	5
Beryllium	0.1-40	6
Cadmium	0.01-0.7	0.06
Chromium	1-1000	100
Copper	2-100	30
Lead	2-200	10
Mercury	0.01-0.3	0.3
Nickel	5-500	40
Selenium	0.1-2	0.3
Silver	0.01-5	0.05
Zinc	10-300	50

Reference: U.S. EPA of Solid Waste and Emergency Response, HAZARDOUS WASTE LAND TREATMENT, SW-874 (April 1983) Page 273, Table 6.46.

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**TABLE 2-3. SUMMARY OF PRIORITY POLLUTANT DATA
NEW VERNON ROAD SITE
SEDIMENT SAMPLES**

	SED-13	SED-14	FB-1 (2526)	TB-2 (2527)	TB-4 (2556)	TB-5 (2558)
Volatile Organics (ug/kg)						
Methylene Chloride	2JB	3JB	4JB	4JB	---	6B
Chloroform	3JB	5B	---	---	---	---
Toluene	2JB	3JB	---	---	---	---
Base Neutrals (ug/kg)						
Naphthalene	5J	17J	---			
Diethyl phthalate	64J	92J	2JB			
Phenanthrene	---	450	---			
Fluoroanthrene	---	550	---			
Pyrene	79J	1100	---			
Benzo(b)fluoranthene	---	1000	---			
Benzo(a)pyrene	60J	---	---			
Di-n-butyl phthalate	---	---	0.6JB			
Phenols (mg/kg)	---	1.0	20			
Pesticides/PCBs (ug/kg)						
Beta-BHC	19	---	---			
Metals (mg/kg)						
Chromium	18.4	2.6	---			
Copper	17.6*	41.1*	---			
Lead	15.1R	67.4R	---			
Mercury	---	0.13	---			
Nickel	12.9*	15.6*	---			
Zinc	48.8	98.7	126			

-- Indicates compound was analyzed for but not detected.

J Indicates that the compound was analyzed for and determined to be present in the sample. The mass spectrum of the compound meets the identification criteria of the method. The concentration listed is an estimated value, which is less than the specified minimum lower limit but is greater than zero.

B Analyte was found in the method blank as well as in the sample.

* Indicates duplicate analysis is not within control limits.

R Indicates spike sample recovery is not within control limits.

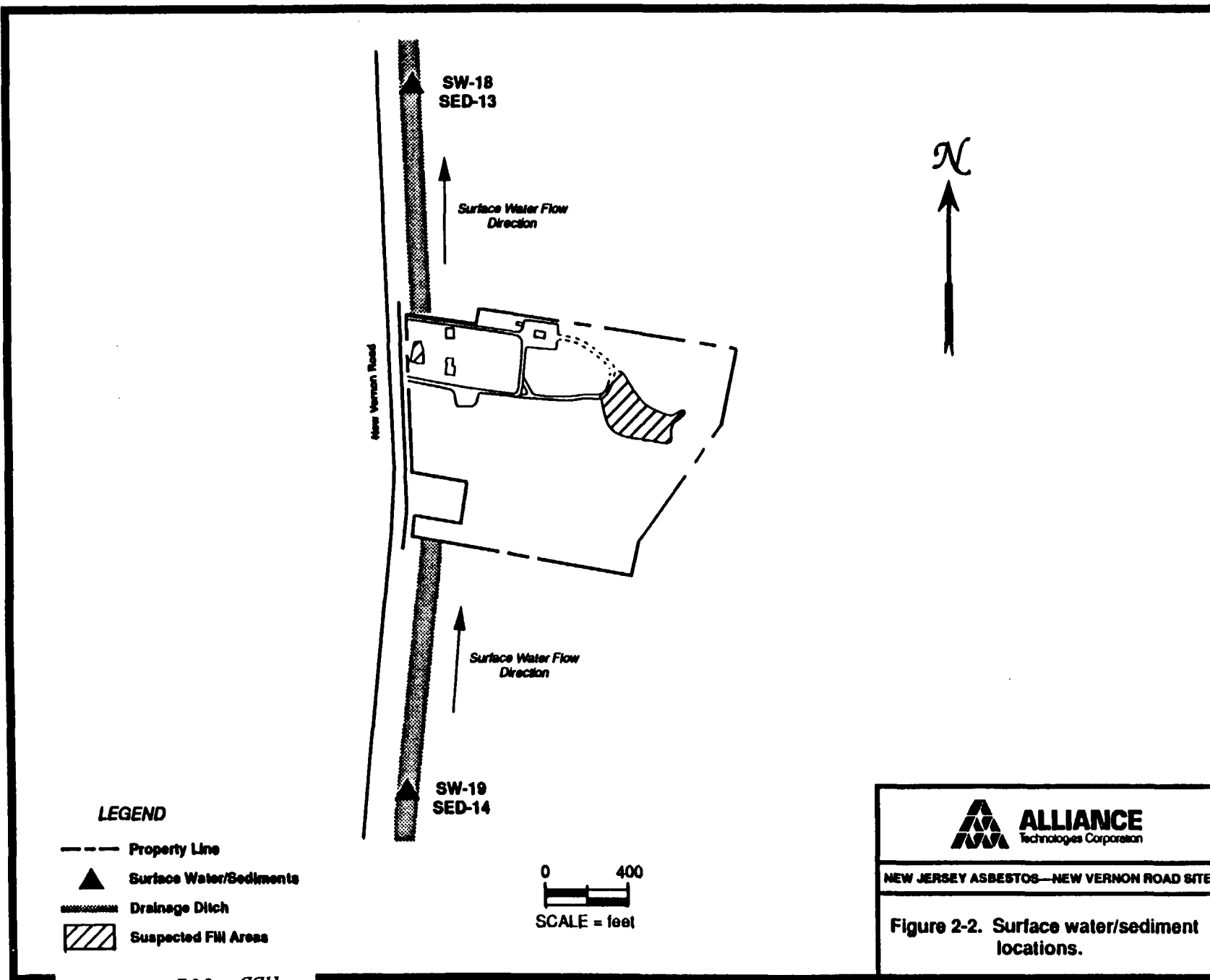
FB Field Blank

TB Trip Blank

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Seven base neutrals were detected in sediment samples SED-13 and SED-14 at concentrations ranging from 5 to 1100 ug/kg. Base neutrals concentrations were naphthalene (5 and 17 ug/kg); diethyl phthalate (64 and 92 ug/kg); phenanthrene (ND and 450 ug/kg); fluoranthene (ND and 550 ug/kg); pyrene (79 and 1100 ug/kg); benzo(b)fluoranthene (ND and 1000 ug/kg) and benzo(a)pyrene (60 ug/kg and ND). In addition, diethyl phthalate (2 ug/kg) and di-n-butyl phthalate (0.6 ug/kg) were detected in the field blank. These base neutrals can be grouped into two groups: polynuclear aromatic hydrocarbons (PAHs) and phthalate esters. SED-14 and the field blank contained phenols concentrations of 1 and 20 ug/kg, respectively. The pesticide, beta-BHC was detected in SED-13 at a level of 19 ug/kg.

Six metals were detected in these samples at concentrations ranging from 2.96 to 98.7 mg/kg. Total metals concentrations for SED-13 and SED-14 were chromium (18.4 and 21.6 mg/kg); copper (17.6 and 41.1 mg/kg); lead (15.1 and 67.4 mg/kg); mercury (ND and 0.13 mg/kg); nickel (12.9 and 15.6 mg/kg) and zinc (48.8 and 98.7 mg/kg). All concentrations of detected metals fall within the range of standard background levels for natural soils (see Table 2-2). In addition, zinc was detected in the field blank (126 mg/kg).

2.1.4 Surface Water

Two surface water samples (SW-18 and SW-19) were collected in proximity to the New Vernon Road Site. These samples were collected in the same locations as the sediment samples discussed in Section 2.1.3 of this report. SW-19 was collected in a drainage ditch located upgradient from the site. SW-18 was collected in a drainage ditch located downgradient from the site. Specific locations of these samples are not included in the National Gypsum RI Report. Analytical results of these surface water samples along with field blanks and trip blanks are presented in Table 2-4. All trip blanks and field blanks taken during surface water sampling activities are presented in this table because National Gypsum does not distinguish in their RI Report which blanks were taken at which asbestos subsite. When discussing the data in their report, all analytical data for all four sites were grouped together. In addition, as indicated from the flags designated as "B", some constituents were present in a laboratory blank. Analytical results from this blank were not presented in the National Gypsum RI Report. Surface water locations are presented in Figure 2-2.

No VOCs were detected in the surface water samples. In the organic fraction of the priority pollutants, three base neutral compounds were detected. All three compounds are classified as phthalate esters. One phthalate ester was detected in SW-18 (diethyl phthalate at a concentration of 1 ug/l). Di-n-butyl phthalate (3 ug/l) and butyl benzyl phthalate (17 ug/l) were detected in SW-19. In addition, the field blank contained 1 ug/l of diethyl phthalate. SW-19 and the field blank contained elevated level of phenols (23 and 32 ug/l, respectively). Table 2-5 presents applicable standards and criteria which are commonly used when evaluating surface waters. Diethyl phthalate and di-n-butyl phthalate were both detected at levels well below the EPA Ambient Quality Criteria (AWQC) (see Table 2-5). No criteria is provided for butyl benzyl phthalate or phenols.

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**TABLE 2-4. SUMMARY OF PRIORITY POLLUTANT DATA
NEW VERNON ROAD SITE
SURFACE WATER**

	SW-18	SW-19	TB-1 (2811)	TB-2 (2527)	TB-3 (2808)	TB-4 (2556)	TB-5 (2558)	FB-2 (2276)
Volatile Organics (ug/l)								
Methylene chloride	---	---	4JB	4JB	---	---	6B	38B
Base Neutral Extractables (ug/l)								
Diethyl phthalate	1J	---						1J
Di-n-butyl phthalate	---	3J						---
Butylbenzyl phthalate	---	17						---
Phenols (ug/l)	---	23						32
Metals (ug/l)								
Cadmium	7	28						---
Chromium	11	---						---
Copper	21	247						---
Lead	18S	570S						---
Mercury	---	0.3						---
Nickel	98	140						88
Zinc	98	1530						---

- Indicates compound was analyzed for but not detected.
 J Indicates that the concentration listed is an estimated value which is less than the specified minimum lower limit but is greater than zero.
 B Analyte was found in the method blank as well as in the sample.
 S Indicates value determined by Method of Standard Addition.
 Blank spaces indicate that the sample was not analyzed for those parameters.
 TB Trip Blank
 FB Field Blank

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TABLE 2-5. APPLICABLE STANDARDS AND CRITERIA FOR SURFACE WATER

Primary Drinking Water Regulations (PDWR)¹

Element	MCL
Cadmium	10 ug/l
Chromium	50 ug/l
Lead	50 ug/l
Mercury	2 ug/l
Silver	50 ug/l

Secondary Drinking Water Regulations (SDWR)²

Element	SMCL
Copper	1000 ug/l
Zinc	5000 ug/l

Ambient Water Quality Criteria (AWQC)³

Diethyl phthalate	350,000 ug/l
Di-n-butyl phthalate	34,000 ug/l
Bis-2-ethylhexyl phthalate	15,000 ug/l
Cyanide	200 ug/l
Nickel	13.4 ug/l

¹Primary Drinking Water Regulations, 40 CFR 141, May 1990.

²Secondary Drinking Water Regulations, 40 CFR 143, May 1990.

³Ambient Water Quality Criteria, September 1986.

Seven metals were detected in surface water samples SW-18 and SW-19 at concentrations ranging from 0.3 to 1530 ug/l. Total metal concentrations were cadmium (7 and 28 ug/l); chromium (ND and 11 ug/l); copper (21 and 247 ug/l); lead (18 and 570 ug/l); mercury (ND and 0.3 ug/l); nickel (98 and 140 ug/l) and zinc (98 and 1530 ug/l). Concentrations exceeding the Maximum Contaminant Levels (MCLs) listed in the Federal Primary Drinking Water Regulations (PDWR) and the Federal Secondary Maximum Contaminant Levels (SMCLs) listed in the Secondary Drinking Water Regulations (SDWR) (see Table 2-5) include cadmium (28 ug/l in SW-19) and lead (570 ug/l in SW-19). The concentration of nickel in both samples exceeded the EPA AWQC (see Table 2-5). Nickel was also detected in the field blank (88 ug/l).

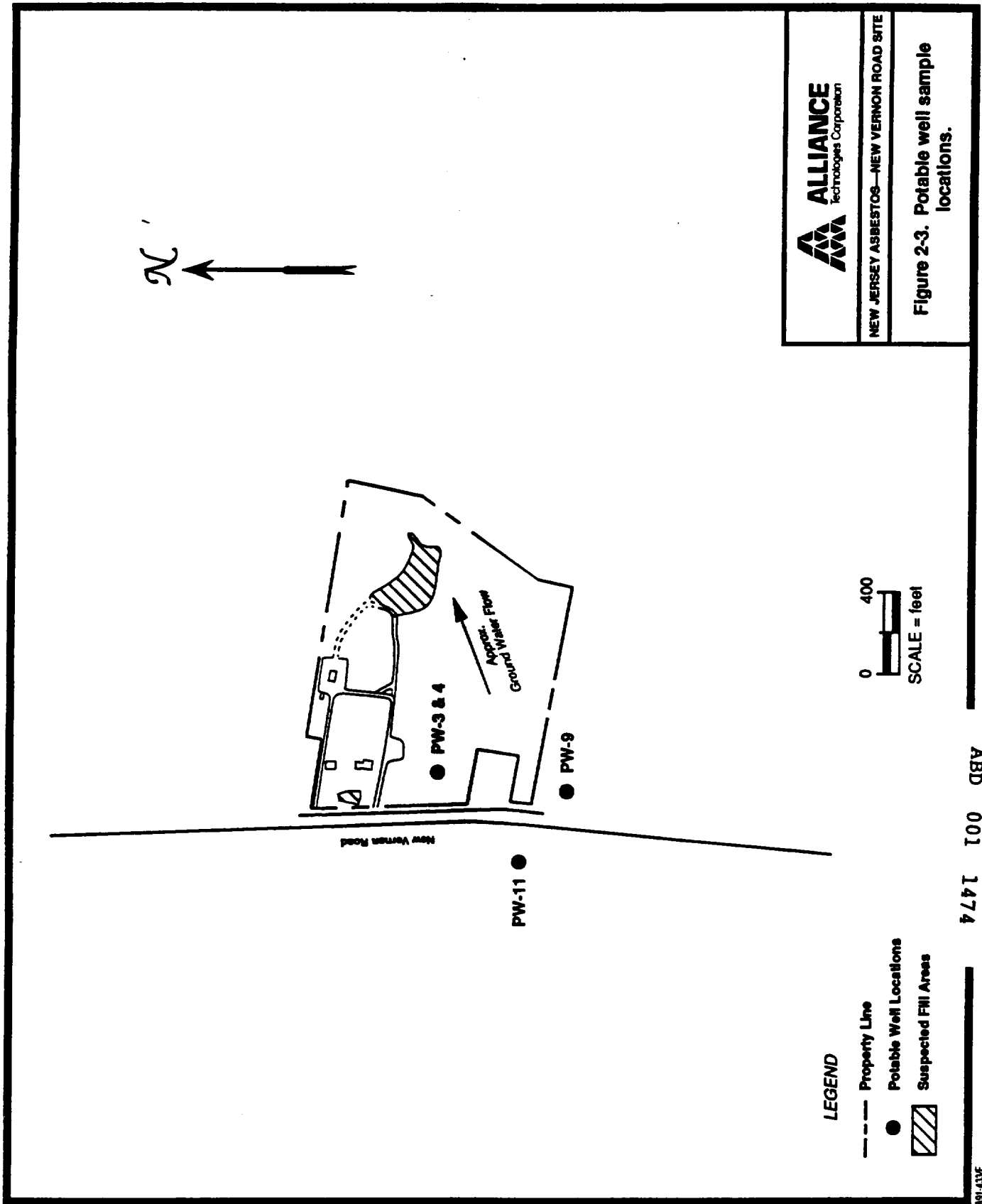
2.1.5 Potable Well Samples

Four potable well samples (PW-3, PW-4, PW-9, and PW-11) were collected from three potable wells located in proximity to the site. PW-4 was a duplicate of PW-3. Approximate potable well sampling locations are presented in Figure 2-3. In addition, direction of ground water flow which was determined in the National Gypsum RI Report, is indicated. All samples were collected from a spigot or tap after three holding tank volumes were removed. Samples were not collected directly from the potable wells.

Potable well samples PW-3 and PW-4 were collected from a resident well located at 257 New Vernon Road. The well was installed in 1984 and is approximately 200 feet deep. Water is extracted from the well via a submersible pump. Sample PW-9 was collected from a resident well located at 201 New Vernon Road. The well is approximately 55 years old and 80 feet deep. Water is extracted from the well via a jet pump. Sample PW-11 was collected from a resident pump located at 23 New Vernon Road. The well is approximately 5 years old and its depth is unknown. Water is extracted from the well via a submersible pump.

Analytical results of these potable well samples along with field blanks and trip blanks are presented in Table 2-6. All trip blanks and field blanks taken during potable well sampling activities are presented in this table because National Gypsum does not distinguish in their RI Report which blanks were taken at which asbestos subsite. When discussing the data in their report, all analytical data for all four sites were grouped together. In addition, as indicated from the flags designated as "B", some constituents were present in a laboratory blank. Analytical results from this blank were not presented in National Gypsum RI Report.

Volatile organic compounds were detected in the potable water samples as well as the trip blanks. Methylene chloride was detected in the samples in concentrations ranging from 4-6 ug/l. Chloroform was detected in all field and trip blanks and in PW-4 and PW-11 in concentrations ranging from 0.6-3 ug/l. Ethylbenzene was detected in PW-11 (0.6 ug/l) and the field blank (0.7 ug/l). These concentrations were compared to the MCLs listed in the Federal Primary Drinking Water Regulations (PDWR), the listed SMCLs in the Federal Secondary Drinking Water Regulations (SDWR) and the New Jersey Ground Water Quality Standards (GWQS). Not all analytes presently have established criteria. None of the analytes mentioned above which had established standards exceeded their standards (see Table 2-7).



**TABLE 2-6. SUMMARY OF PRIORITY POLLUTANT DATA
NEW VERNON ROAD SITE
POTABLE WELL SAMPLES**

	PW-3**	PW-4	PW-9	PW-11	TB (3760)	TB 10/9/86	FB 3757
Volatile Organics (ug/l)							
Methylene chloride	5B	5B	4JB	4JB	6B	5B	5B
Chloroform	---	1JB	---	0.6JB	3JB	3JB	2JB
Ethylbenzene	---	---	---	0.6JB			0.7JB
Base Neutrals Extractables (ug/l)							
Di-n-butyl phthalate	---	---	---	---			0.7J
Bis-2-ethylhexyl phthalate	---	---	---	10			---
Di-n-octyl phthalate	---	---	---	---			2JB
Pesticides/PCBs (ug/l)							
Aldrin	0.002J	0.003J	---	---			---
Phenols (ug/l)	7	42	9	19			10
Metals (ug/l)							
Arsenic	6.89	---	---	---			---
Copper	64	---	---	---			---
Chromium	---	---	---	---			---
Lead	---	---	---	---			5.5
Nickel	45N	---	---	---			---
Silver	---	---	---	10			---
Zinc	91N	70N	207N	161N			38N

- Indicates compound was analyzed for but not detected.
J Indicates that the compound was analyzed for and determined to be present in the sample. The mass spectrum of the compound meets the identification criteria of the method. The concentration listed is an estimated value, which is less than the specified minimum lower limit but is greater than zero.
B Analyte was found in the method blank as well as in the sample.
** PW-3 is a duplicate of PW-4.
N Indicates spike sample recovery is not within control limits.
Blank space indicates that the sample was not analyzed for that parameter.
TB Trip Blank
FB Field Blank

TABLE 2-7. GROUND WATER QUALITY STANDARDS - NON-METALS

Analyte	NJDEP GWQS ¹ (ug/l)	PDWR ² (ug/l)	SDWR ³ (ug/l)
Volatile Organic Compounds			
Benzene	---	5	---
Chloroform	---	100	---
1,1-Dichloroethane	---	---	---
1,1-Dichloroethene	---	---	---
Ethyl Benzene	---	---	---
Methylene Chloride	---	---	---
Toluene	---	---	---
Trans-1-2,dichloroethene	---	---	---
1,1,2,2-Tetrachloroethane	---	---	---
1,1,1-Trichloroethane	---	200	---
Trichloroethene	---	5	---
Trichlorofluoromethane	---	---	---
Base Neutral Compounds			
Bis(2 chloroisopropyl) ether	---	---	---
Bis-2-ethylhexyl phthalate	---	---	---
Butyl benzyl phthalate	---	---	---
Diethyl phthalate	---	---	---
Di-n-butyl phthalate	---	---	---
Di-n-octyl phthalate	---	---	---
2-chlorophenol	---	---	---
Phenols	3500	---	---

NJDEP New Jersey Department of Environmental Protection
¹GWQS Ground Water Quality Standards
²PDWS Primary Drinking Water Standards, May 1990.
³SDWS Secondary Drinking Water Standards, May 1990.
 --- Indicates that no standard exists for that constituent

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TABLE 2-7. (CONTINUED)

Analyte	NJDEP GWQS ¹ (ug/l)	PDWR ² (ug/l)	SDWR ³ (ug/l)
Pesticides			
Aldrin	0.003	---	---
Alpha-BHC	---	---	---
Beta-BHC	---	---	---
Endrin	0.004	0.2	---
Cyanide	200	---	---
Asbestos ⁴	---	7 million fibers/liter (longer than 10 um)	---

NJDEP New Jersey Department of Environmental Protection

¹GWQS Ground Water Quality Standards

²PDWR Primary Drinking Water Regulations, 40 CFR 141, May 1990.

³SDWR Secondary Drinking Water Regulations, 40 CFR 143, May 1990.

⁴Per 40 CFR 141.62 revised 56 FR 3578, January 30, 1991.

--- Indicates that no standard exists for that constituent

One base neutral was found in one of the potable well samples (PW-9 contained 10 ug/l of Bis-2-ethylhexyl phthalate). In addition, di-n-butyl phthalate (2 ug/l) and di-n-octyl phthalate (0.7 ug/l) were detected in the field blank. An estimated value of one pesticide, aldrin, was found in PW-3 and PW-4 (at levels of 0.002 and 0.003 ug/l, respectively). Phenols were detected in all four samples at concentrations ranging from 7 to 42 ug/l. In addition, 10 ug/l of phenols were detected in the field blank. As indicated by Table 2-7, the higher concentration of aldrin, detected in PW-4, is equal to the NJDEP-GWQS. No criteria has been established for phenols or bis-2-ethylhexyl phthalate.

The potable well sampling results indicate the presence of arsenic, copper, nickel and zinc at levels above the CRQLs but below the MCLs established in the NJDEP-GWQS, PDWS or SDWS (see Table 2-8). Arsenic was found in PW-3 at 6.89 ug/l but not in its duplicate PW-4. This concentration is below the MCL of 50 ug/l. Nickel was found in PW-3 at 45 ug/l but not in its duplicate PW-4. No criteria is presently established for nickel. Copper was found in PW-3 at 64 ug/l but not in its duplicate PW-4. This concentration is well below copper's MCL of 1000 ug/l. Zinc was found in all four samples and ranged from 70 to 207 ug/l. This concentration is well below zinc's secondary MCL of 5000 ug/l. No primary MCL has been established for zinc. Lead (5.5 ug/l) and zinc (38 ug/l) were also detected in the field blank.

2.1.6 Ground Water Samples

Three ground water samples (NVR1, NVR2 and NVR3) were analyzed from monitoring wells installed at the New Vernon Road Site as reported in the National Gypsum RI Report. All three wells were constructed with ten feet of screen and were advanced to the following depths below surface grade: Monitoring Well NVR1, 12.0 feet; Monitoring Well NVR2, 14.2 feet; and Monitoring Well NVR3, 13.0 feet. Analytical results of these ground water samples along with two trip blanks are presented in Table 2-9. This table was taken from the National Gypsum RI Report and indicates from the flags designated as "B" in some of the analytes, that some of the analytes were found in a laboratory blank as well as the sample. Analytical data from this laboratory blank are not presented in the National Gypsum RI Report. Ground water sampling locations and the approximate direction of ground water flow which was determined in the National Gypsum RI Report is presented in Figure 2-1.

Overall, a total of eight organic constituents were detected in the ground water samples. None of these organic constituents were detected in concentrations that exceeded the NJDEP-GWQS, PDWR or SDWR (see Table 2-7) for compounds for which these standards have been established. Many of these constituents do not presently have established criteria. Detectable volatile organic concentration ranges were: methylene chloride (6-36 ug/l), trichlorofluoromethane (0.4 ug/l), chloroform (2-7 ug/l), ethyl benzene (0.9-1.0 ug/l) and 1,1,2,2-tetrachloroethane (1-2 ug/l). In addition, six volatile organics were detected in the trip blanks. Methylene chloride (12-13 ug/l) and chloroform (4-5 ug/l) were present in both trip blanks. Trichlorofluoromethane (0.5 ug/l), trichloroethane (0.9 ug/l) and ethyl benzene (0.9 ug/l) were detected in TB-2 and 1,1,2,2-tetrachloroethane (3 ug/l) was detected in TB-1.

TABLE 2-8. GROUND WATER QUALITY STANDARDS - METALS

Analyte	NJDEP GWQS ¹ (ug/l)	PDWR ² (ug/l)	SDWR ³ (ug/l)
Metals			
Antimony	---	---	---
Arsenic	50	50	---
Beryllium	---	---	---
Cadmium	10	10	---
Chromium	50	50	---
Copper	1000	---	1000
Lead	50	50	---
Mercury	2	2	---
Nickel	---	---	---
Silver	50	50	---
Zinc	5000	---	5000

NJDEP New Jersey Department of Environmental Protection
¹GWQS Ground Water Quality Standards
²PDWR Primary Drinking Water Regulations, 40 CFR 141, May 1990.
³SDWR Secondary Drinking Water Regulations, 40 CFR 143, May 1990.
 --- Indicates that no standard exists for that constituent.

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**TABLE 2-9. SUMMARY OF PRIORITY POLLUTANT DATA
NEW VERNON ROAD SITE
GROUND WATER MONITORING WELL SAMPLES**

	Sample Number				
	NVR1	NVR2	NVR3	TB (10/15/87)	TB (10/16/86)
Volatile Organics (ug/l)					
Methylene Chloride	6B	36B	13B	13B	12B
Trichlorofluoromethane	--	--	0.4J	--	0.5J
Chloroform	2B	2JB	7B	5B	4JB
Trichloroethane	--	--	--	--	0.9J
1,1,2,2-Tetrachloroethane	--	2J	1JB	3J	--
Ethyl Benzene	--	0.9JB	1J	--	0.9J
Base Neutrals Extractables (ug/l)					
Diethyl phthalate	--	0.4J	---		
Di-n-butyl phthalate	15	5J	6J		
Metals (mg/l)					
Chromium	--	35	31		
Mercury	4.5	--	--		
Zinc	71	638	554		
Phenols (ug/l)	130	--	--		

-- Indicates compound was analyzed for but not detected.

J Indicates that the compound was analyzed for and determined to be present in the sample. The mass spectrum of the compound meets the identification criteria of the method. The concentration listed is an estimated value, which is less than the specified minimum lower limit but is greater than zero.

B Analyte was found in the method blank as well as in the sample.
Blank space indicates that the sample was not analyzed for that parameter.

TB Trip Blank

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Two base neutral compounds were detected. Diethyl phthalate was detected in Monitoring Well NVR2 at an estimated value of 0.4 ug/l. Di-n-octyl phthalate was detected in all three monitoring wells at concentrations ranging between 5-15 ug/l. In addition, phenols were detected in Monitoring Well NVR1 at a value of 130 ug/l.

Results of the metal analysis indicate that three constituents (chromium, mercury and zinc) were detected. The concentrations of chromium (31-35 ug/l) and zinc (71-638 ug/l) are below their respected MCLs. Mercury was detected in Monitoring Well NVR1 at a concentration of 4.5 ug/l which exceeds the NJDEP-GWQS and PDWR of 2 µg/l (see Table 2-8).

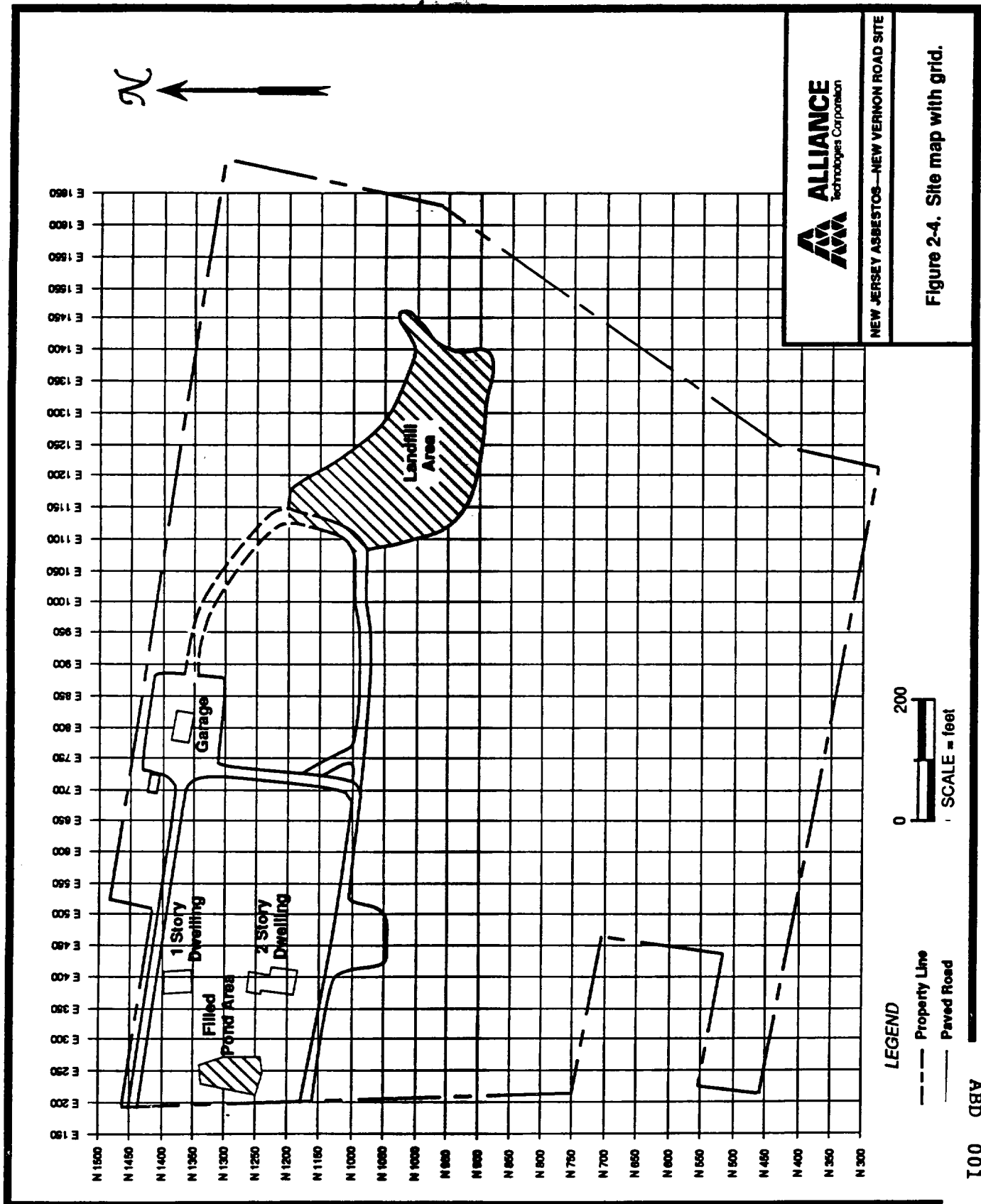
2.2 Asbestos

2.2.1 Sources

In October and November 1990, Alliance Technologies Corporation, as contracted by the EPA, performed additional field activities to characterize the lateral and vertical extent of the asbestos fill areas. Tasks performed included: surveying the site to develop a grid pattern for sampling purposes and topographic maps (see Figure 2-4); a geophysical investigation utilizing ground penetrating radar (GPR) in selected locations; air sampling; soil sampling using hand augers and in some instances, a drill rig; and analysis of the air and soil samples at a National Institute of Standards and Technology (NIST) certified laboratory. Three analytical approaches were used to characterize the extent of contamination. These were: visual screening, polarized light microscopy (PLM), and transmission electron microscopy (TEM).

A Ground Penetrating Radar (GPR) survey was performed at the New Vernon Road Site to determine the vertical and lateral extent of the asbestos fill material. Although GPR does not allow detection of asbestos containing material, the GPR method is useful for differentiating between naturally bedded material (soils, sand, clay, and peat deposits), and non-natural occurring exotic material dumped at this site composed primarily of asbestos tiles. The purpose of the GPR survey was to assist in identifying the uppermost fill areas. Alliance also used the GPR data to assist in the selection of optimum locations for subsurface borings. Figure 2-5 shows the locations of GPR profile traverses collected from the site. A total of 2500 linear feet of GPR data were collected using a 300 MHz antenna at the site. The radar unit was towed by hand at approximately 1 to 2 feet per second (walking pace). The recording time for each GPR trace was 90 nanoseconds.

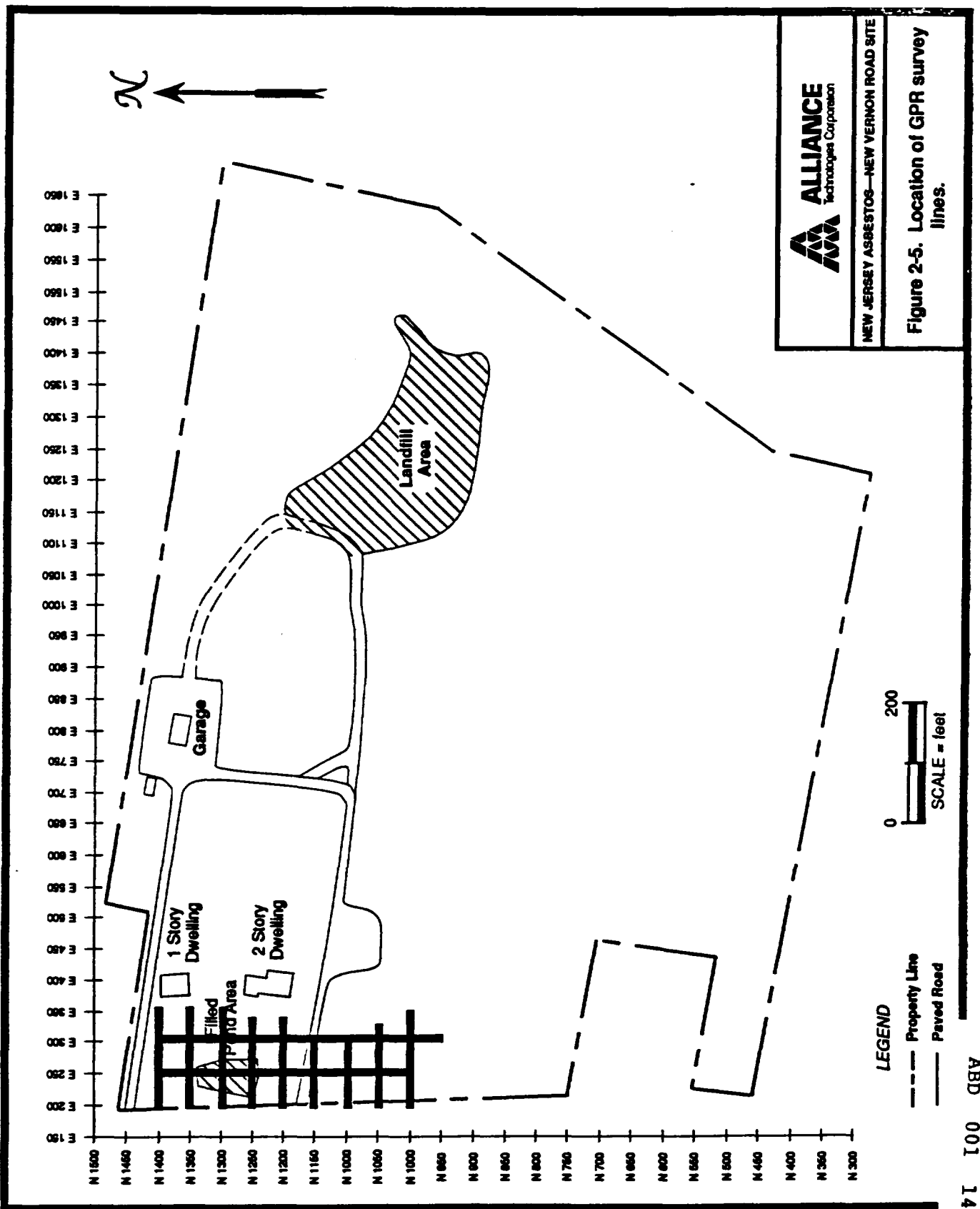
The raw GPR data from the New Vernon Road Site were interpreted immediately after the field survey to identify subsurface utility lines and to determine a preliminary interpretation of the thickness and extent of the fill material. It was found that the GPR signal was not able to penetrate the highly conductive, clay-rich topsoil at certain locations and therefore, the interpretation based on GPR data was inadequate for determining the thickness and extent of the asbestos fill material. The GPR data did not provide sufficient information for determining priority soil boring locations.



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Surface and subsurface soil samples were collected at grid nodes located throughout the site. Samples were collected at 50 foot intervals in the northwest section of the site around the buildings. Samples were collected at grid nodes located at 100 foot intervals on the remainder of the property. Some node locations were not sampled because their locations were not accessible. In areas where grid node points were accessible, but samples were not able to be collected (due to hardness of ground surface or lack of soil, etc.), the sample was collected as close as possible to the grid node. No composite samples were collected. Specific grid point locations are included in the analytical results summary presented later in this report in Table 2-11.

Each sample was visually inspected on site. Samples were not homogeneous throughout the property. Many samples contained asbestos fill material which was very distinguishable from the surrounding subsurface soil due to the presence of tiles, shingles and/or wallboard slurry. If the sample contained any obvious asbestos containing material (i.e., tiles, shingles or wallboard slurry) or any visual asbestos fibers, the sample was analyzed by PLM. PLM is the EPA-recommended method of determining asbestos in bulk samples and is more cost effective than TEM. If the sample did not contain any obvious asbestos containing material or visible asbestos fibers it was analyzed by TEM. TEM provides a more precise measurement of asbestos concentrations in samples but is more cost prohibitive.

One of the differences between the methods used in the analysis of soil samples for asbestos is that the TEM method is much more exact and sensitive than the PLM method. This greater degree of exactness and sensitivity is due to the higher resolution provided by an electron microscope over that of a light microscope. With the resolution offered by the electron microscope utilized in the TEM method, it is possible to identify each fiber present in the sample being analyzed and also determine its length, width and thickness. Based upon the dimensions of each fiber present, their mass is calculated and then, using the total mass of the sample, the percentage of asbestos is calculated. The resolution of the light microscope used in the PLM method is much lower and does not allow the measurement of the dimensions of individual fibers. In order to determine the percentage of asbestos in a sample by the PLM method, it is necessary to "estimate" the percentage of asbestos fibers present in the field of view of the microscope according to the EPA "Interim Method for the Determination of Asbestos in Bulk Insulation Samples", EPA 600/M-4-82-020, December 1982. The PLM method, therefore, does not offer a percentage based on the weights of the fibers present in the sample as does the TEM method. The difference in the degrees of sensitivities provided by each method is reflected in the lower detection limit of 0.5 percent for the TEM method, as opposed to a higher detection limit of 1.0 percent for the PLM method.

The reason that the TEM method is deferred in favor of the PLM method when higher asbestos concentrations are expected is that the grid openings used in the TEM method (as cited in the Federal Register, Volume 52, Number 210) become obscured when higher percentages of asbestos are present, making it difficult to count individual fibers and determine their dimensions. Therefore, when a sample, upon visual inspection, exhibits

possible asbestos contamination, the PLM method is the preferred method of determining the percentage of asbestos in the sample.

From the analytical results, the extent of asbestos contamination was quantified on the New Vernon Road property. Figure 2-6 presents the locations of asbestos containing material on the surface. In addition to identifying these areas, areas containing asbestos concentrations in excess of 0.5 percent, 1.0 percent and 10 percent are delineated. A larger more detailed map identifying asbestos concentrations at the surface is presented in a foldout map located in the back of this report. From Figure 2-6, approximate surface areas of asbestos fill material were calculated. Table 2-10 presents the surface area calculations from the different asbestos fill areas located on Figure 2-6. These surface areas are calculated for asbestos fill areas which contain asbestos in concentrations greater than 0.5 percent, 1.0 percent and 10 percent at the 0 to 6" interval. From these calculations, approximate total surface areas of asbestos fill material at the surface in excess of 0.5 percent, 1.0 percent and 10 percent are 95,133, 74,120, and 35,720 square feet, respectively.

The thickness of the asbestos fill was determined by the laboratory analysis of 190 shallow subsurface samples, 40 deeper subsurface samples and by visual inspection. Locations and thickness of the asbestos fill material is presented in Figure 2-7.

In addition, four vertical profiles were developed to better quantify the vertical extent of the asbestos fill areas. The locations of these geologic profiles are presented in Figure 2-8. Two vertical profiles are located across the main landfill area along transects A to A' and B to B'. The other two vertical profiles are located across the three smaller fill areas near the northwest section of the site along transects C to C' and D to D'. These geologic profiles are presented in Figures 2-9, 2-10 and 2-11.

From Figure 2-7, approximate volumes of each asbestos fill area were calculated. From these calculations, the total volume of asbestos fill material in all asbestos fill areas located on the site is approximately 15,760 cubic yards.

2.2.2 Surface Soils

This section presents the results of the asbestos levels found in the surface soil sampled during the field investigation performed by EPA in October and November 1990. No surface soil samples were collected during the National Gypsum RI.

A total of 188 surface soil samples were collected and analyzed for asbestos concentrations during the field investigation program. These surface soil samples were collected from the 0 to 6" interval. Analytical results are presented in Table 2-11. In addition, shallow subsurface soil samples, collected at greater depths are also presented on the table and are discussed in Section 4.2.3. This table also presents grid locations for each sample. Corresponding grid locations are presented in Figure 2-4. Of these 188 samples, 151 or approximately 80 percent were analyzed by TEM. As previously discussed, where visual inspection of surface soil

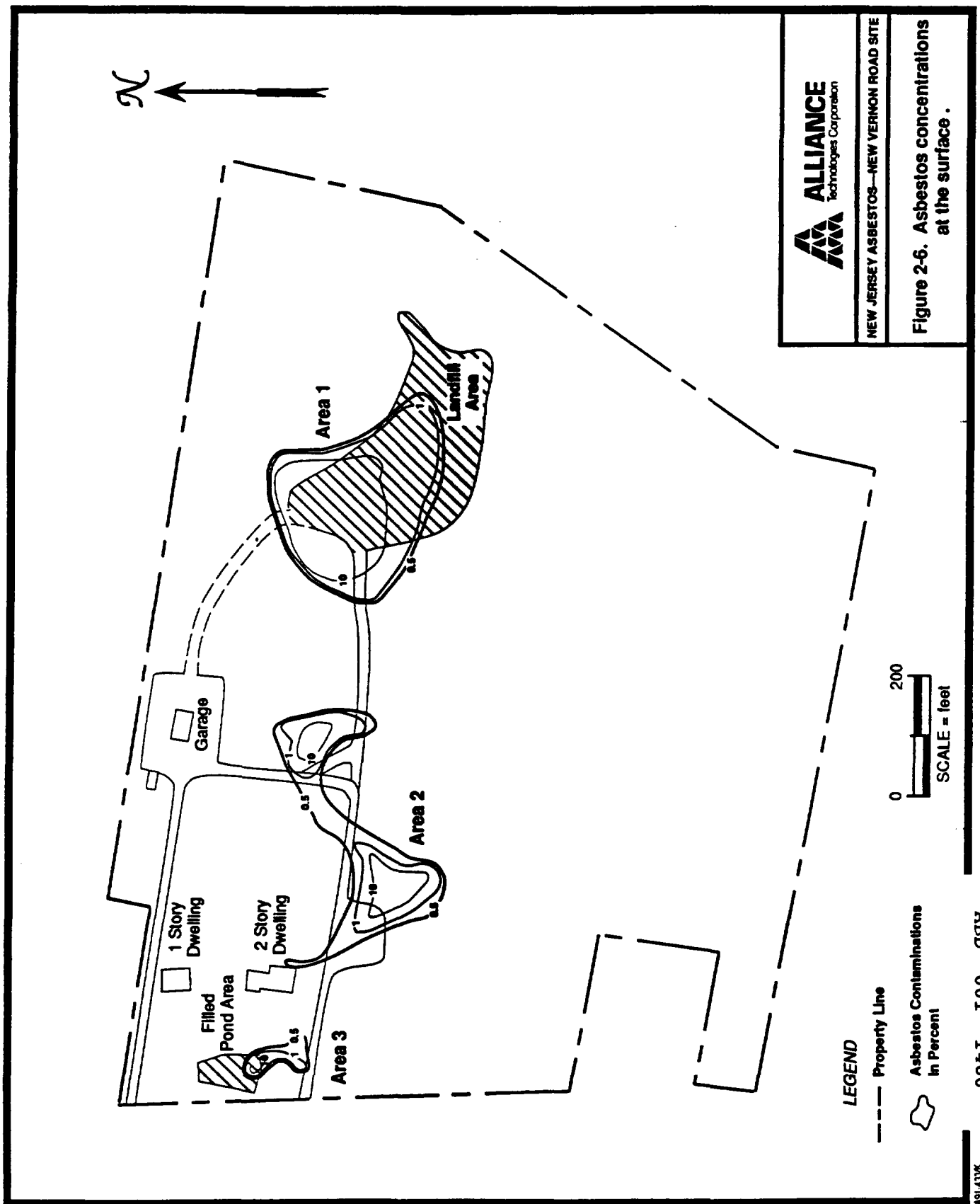
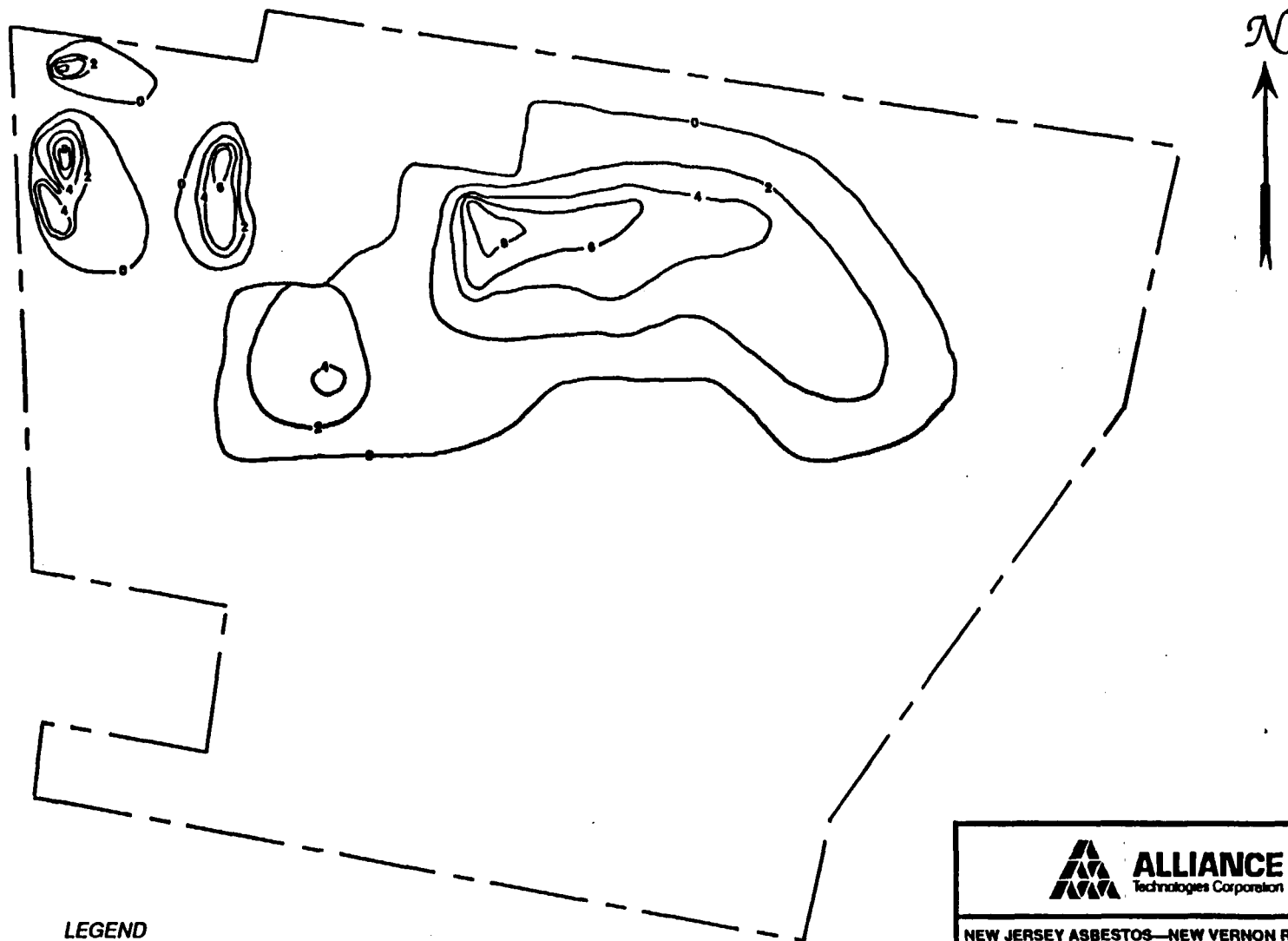


TABLE 2-10. SURFACE AREAS OF ASBESTOS FILL MATERIAL AT
THE SURFACE (SQUARE FEET)

Area No.	0.5 percent	1.0 percent	10 percent
1	59,444	53,000	28,240
2	32,600	19,480	6,920
3	3,089	1,560	560
Totals	95,133	74,120	35,720



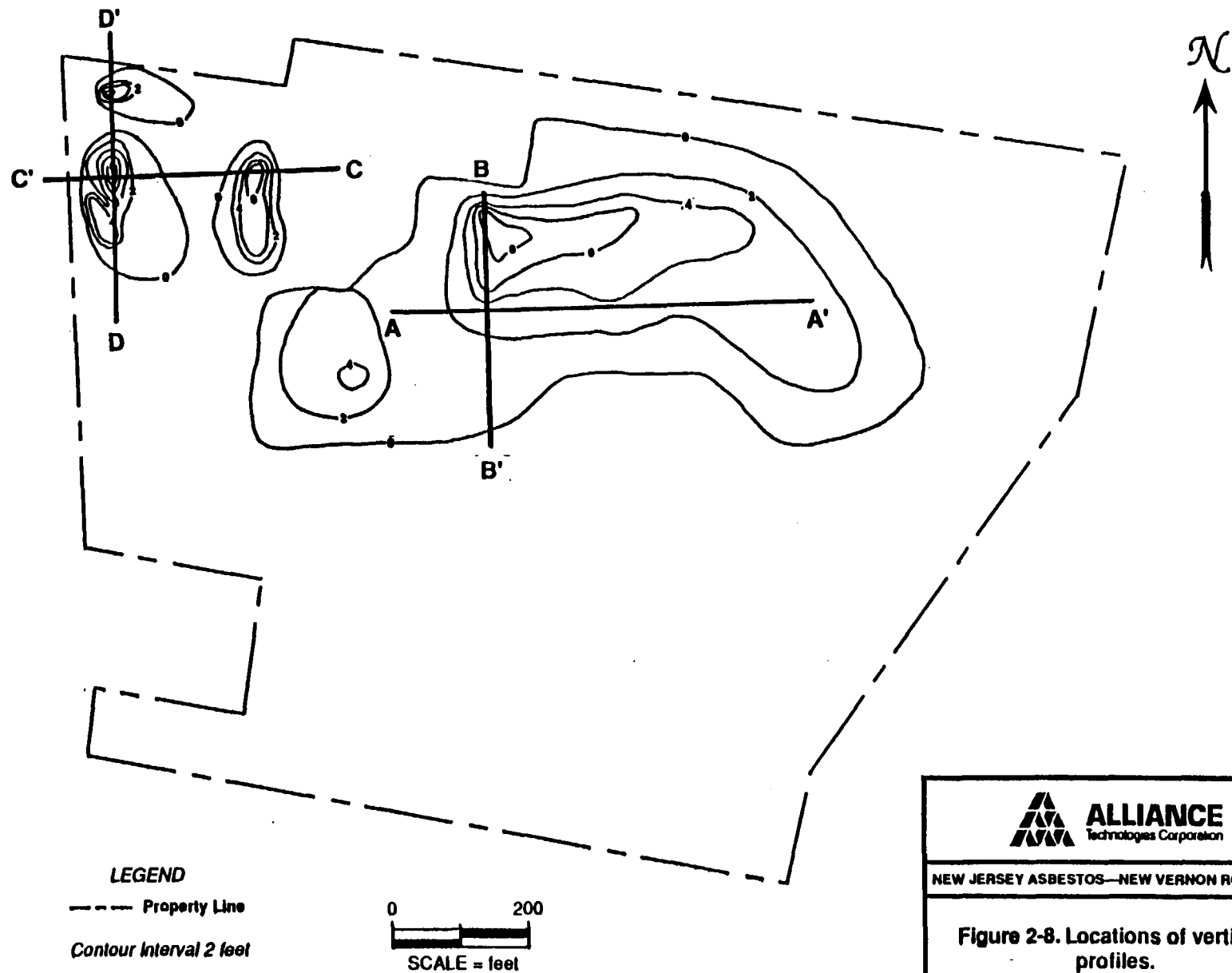
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 --- Property Line
 Contour Interval 2 feet

0 200
 SCALE = feet

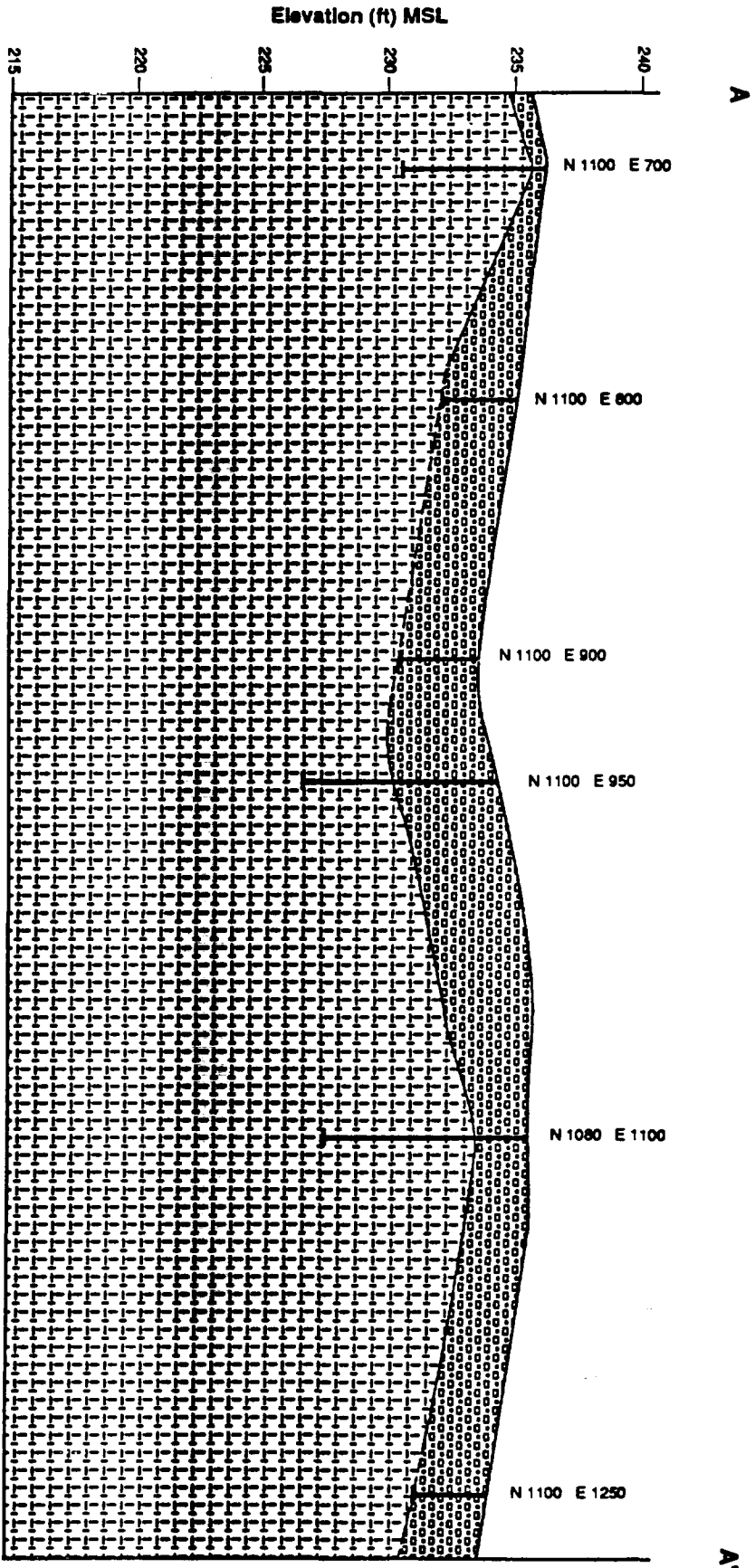


NEW JERSEY ASBESTOS—NEW VERNON ROAD SITE

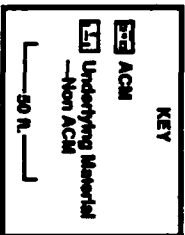
Figure 2-7. Thickness of asbestos fill material.



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Note: Due to inaccessibility of locations N 1100 E 800, N 1100 E 900 and N 1100 E 1250, they were sampled by hand and were unable to penetrate any deeper due to nature of ACM.

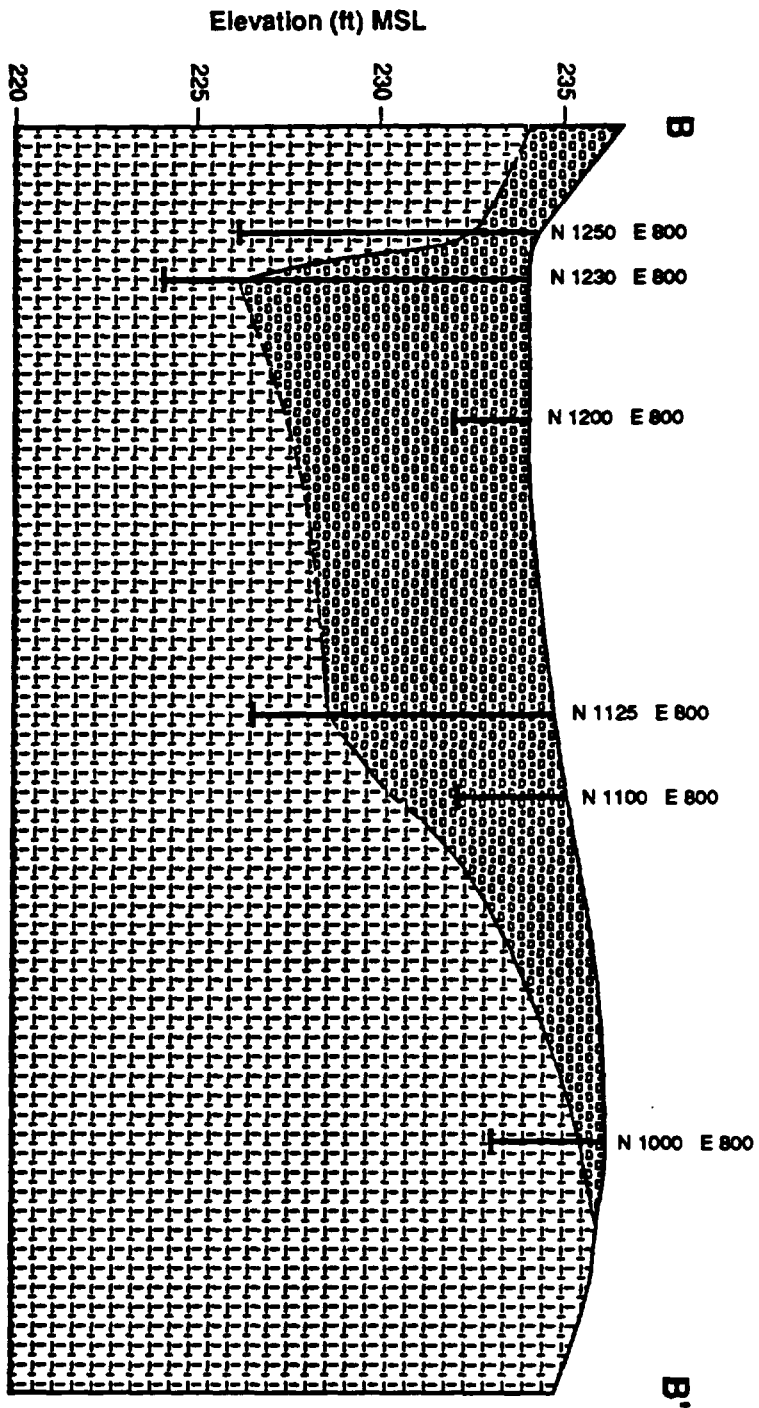


0641 100 CBD

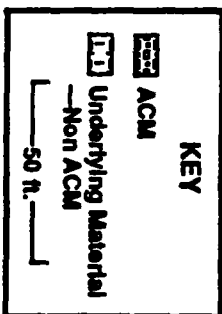
Figure 2-9. Geologic profile from A to A'.



AM-43M



Note: Due to inaccessibility of locations N 1200 E 800 and N 1100 E 800 they were sampled by hand and were unable to penetrate any deeper due to nature of ACM.



1641 100 BDV

Figure 2-10. Geologic profile from B to B'.



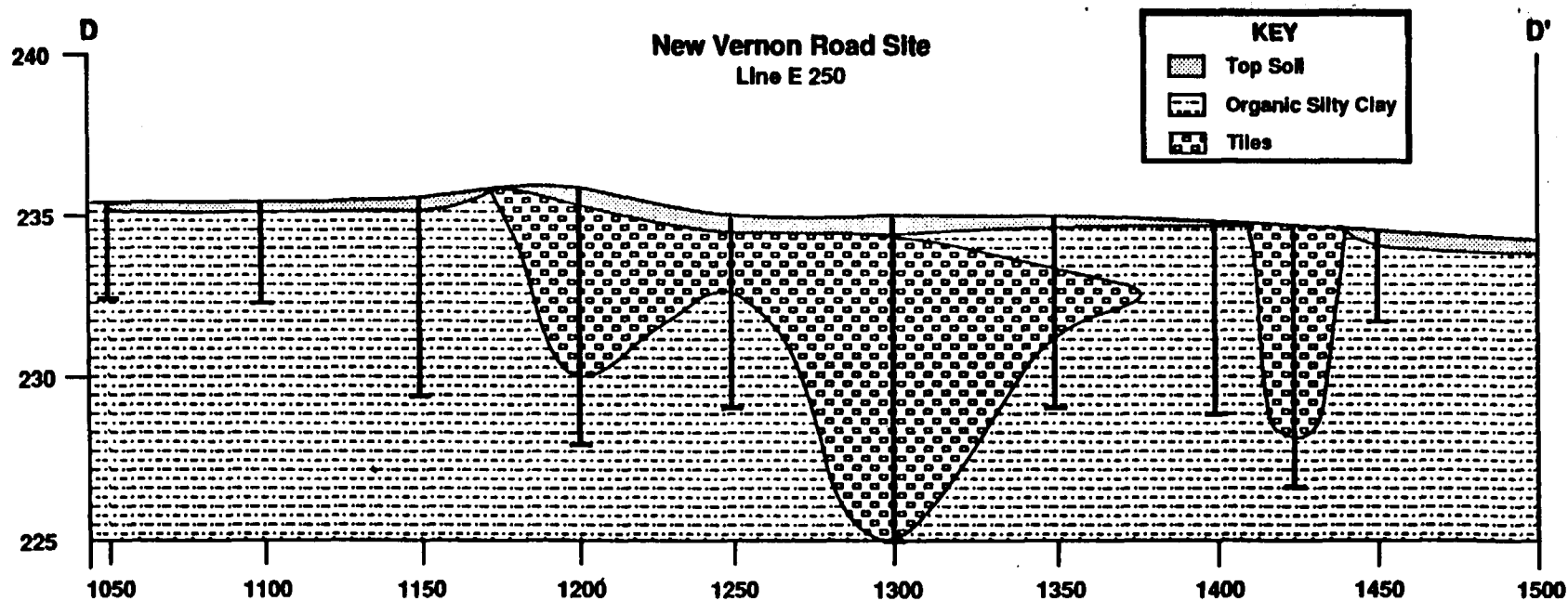
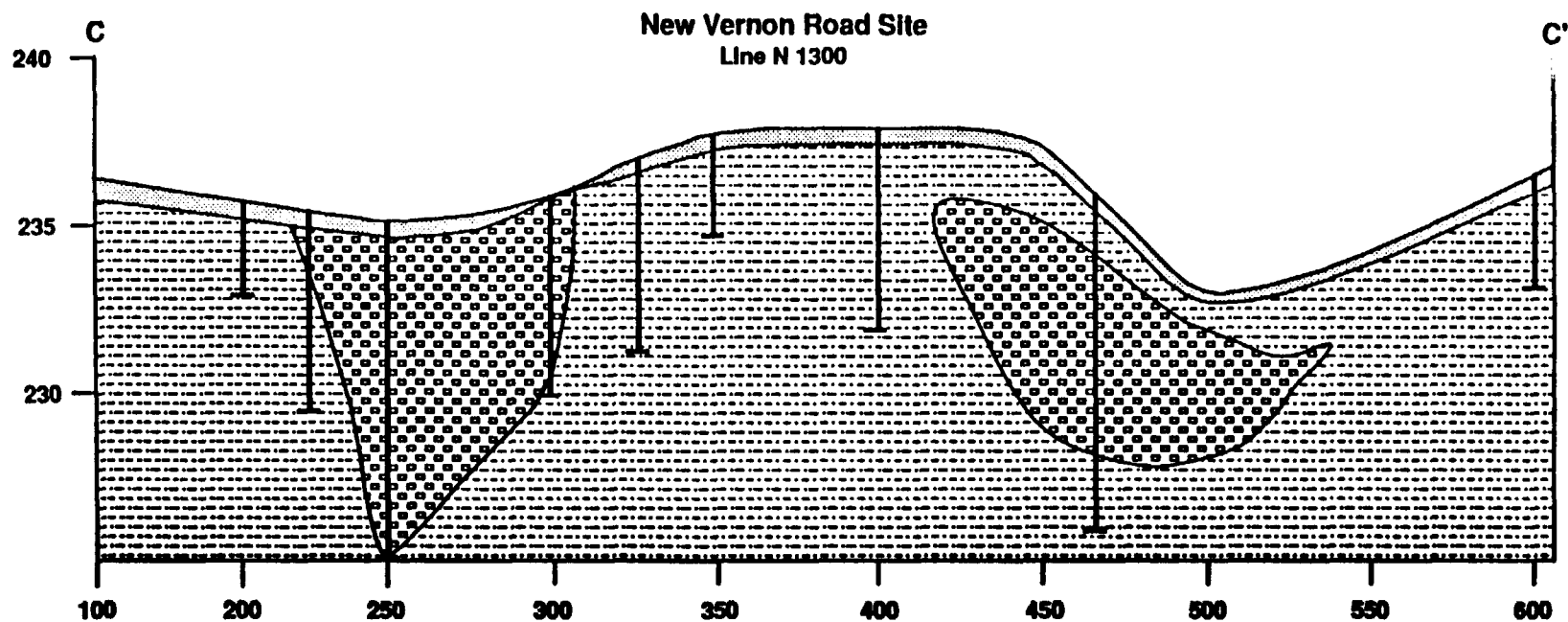


Figure 2-11. Geological cross sections at New Vernon Road.

Table 2-11. Analytical Results Survey—New Vernon Road

Grid Point	Sampling Date	Depth (inches)	Analytical Technique		Comments
			TEM % Asbestos	PLM % Asbestos	
N 500 E 1100	-11/7-	6	0		
N 500 E 1200	-11/7-	6	0		
N 500 E 1300	-11/7-	6	0		
N 600 E 1100	-11/7-	6	0		
N 600 E 1200	-11/7-	6	0		
N 700 E 700	-11/6-	6	0		
N 700 E 800	-11/6-	6	0		
N 700 E 800	-11/6-	18	0		
N 700 E 900	-11/6-	6	0		
N 700 E 1000	-11/7-	6	0		
N 700 E 1100	-11/7 -	6	0		
N 700 E 1200	-11/7 -	6	0		
N 700 E 1400	-11/8-	6	0		Lab Duplicate
N 700 E 1400	-11/8-	6	0		Lab Duplicate
N 750 E 300	-11/5-	6 A	0		Field Duplicate
N 750 E 300	-11/5-	6 B	0		Field Duplicate
N 750 E 450	-11/5-	6	0		
N 800 E 250	-11/5-	6	0.007253		
N 800 E 362	-11/5-	6	0		
N 800 E 700	-11/6-	6	0		
N 800 E 800	-11/6-	6	0.000358		
N 800 E 900	-11/6-	6	0		
N 800 E 900	-11/6-	18	0		
N 800 E 1000	-11/7-	6	0		Lab Duplicate
N 800 E 1000	-11/7-	6	0		Lab Duplicate
N 800 E 1100	-11/7-	6 A	0		Field Duplicate
N 800 E 1100	-11/7-	6 A	0		Lab Duplicate
N 800 E 1100	-11/7-	6 B	0		Field Duplicate
N 800 E 1100	-11/7-	18 A	0		
N 800 E 1200	-11/7-	6	0		
N 800 E 1300	-11/7-	6	0		
N 800 E 1400	-11/8-	6	0		

PLM – Polarized Light Microscopy; TEM – Transmission Electron Microscopy

TEM Method detection limit is 0.5 %. PLM detection Limit is 1 %

Table 2-11. Analytical Results Survey—New Vernon Road

Grid Point	Sampling Date	Depth (Inches)	Analytical Technique		Comments
			TEM % Asbestos	PLM % Asbestos	
N 800 E 1450	-11/8-	6	0		
N 822 E 600	-11/6-	6	0		
N 900 E 250	-11/5-	6	0.001381		
N 900 E 250	-11/5-	18	0		
N 900 E 300	-11/5-	6	0.00297		
N 900 E 350	-11/5-	6 A	0.000364		Field Duplicate
N 900 E 350	-11/5-	6 B	0.004047		Field Duplicate
N 900 E 350	-11/5-	18 A	0		
N 900 E 450	-11/5-	6	0.000917		
N 900 E 500	-11/13-	6	0.000598		Lab Duplicate
N 900 E 500	-11/13-	6	0		Lab Duplicate
N 900 E 550	-11/9-	6	0.001201		
N 900 E 600	-11/5-	6	0		
N 900 E 700	-11/6-	6 A	0		Field Duplicate
N 900 E 700	-11/6-	6 B	0		Field Duplicate
N 900 E 800	-11/6-	6	0		
N 900 E 800	-11/6-	18	0		
N 900 E 900	-11/6-	6	0		
N 900 E 1000	-11/6-	6	0		Lab Duplicate
N 900 E 1000	-11/6-	6	0		Lab Duplicate
N 900 E 1100	-11/7-	6	0		
N 900 E 1200	-11/7-	6 A	0		Field Duplicate
N 900 E 1200	-11/7-	6 B	0		Field Duplicate
N 900 E 1200	-11/7-	18 A	0		
N 900 E 1300	-11/7-	6	0		Lab Duplicate
N 900 E 1300	-11/7-	6	0.000858		Lab Duplicate
N 950 E 300	-11/6-	18	0		
N 950 E 400	-11/6-	18	0		
N 950 E 1450	-11/8-	6	0		
N 1000 E 250	-11/5-	6	0.000938		
N 1000 E 250	-11/5-	18	0		Lab Duplicate
N 1000 E 250	-11/5-	18	0		Lab Duplicate

PLM - Polarized Light Microscopy; TEM - Transmission Electron Microscopy

TEM Method detection limit is 0.5 %. PLM detection Limit is 1 %

Table 2-11. Analytical Results Survey—New Vernon Road

Grid Point	Sampling Date	Depth (Inches)	Analytical Technique		Comments
			TEM % Asbestos	PLM % Asbestos	
N 1000 E 300	-11/5-	6	0.003281		
N 1000 E 350	-11/5-	6	0.005827		
N 1000 E 350	-11/5-	18	0		
N 1000 E 400	-11/6-	6	0		
N 1000 E 450	-11/5-	6	0		
N 1000 E 450	-11/5-	18	0		
N 1000 E 550	-11/8-	6		30	
N 1000 E 600	-11/5-	6	0.013651		
N 1000 E 600	-11/5-	18	1.05241		
N 1000 E 700	-11/5-	6	0		
N 1000 E 800	-11/6-	6	0		
N 1000 E 900	-11/6-	6	0.000235		
N 1000 E 1000	-11/6-	6	0.000190		
N 1000 E 1100	-11/6-	6	0.421462		
N 1000 E 1275	-11/7-	6	0.348931		
N 1000 E 1500	-11/8-	6	0		
N 1021 E 395	-11/9-	6	0		
N 1037 E 550	-11/8-	6 A		20	Field Duplicate
N 1037 E 550	-11/8-	6 B		20	Field Duplicate
N 1037 E 550	-11/8-	18 A	1.048996		
N 1050 E 300	-11/6-	18	0		
N 1050 E 1500	-11/8-	6	0		
N 1050 E 1550	-11/8-	6	0		
N 1062 E 429	-11/9-	6	0.000471		Lab Duplicate
N 1062 E 429	-11/9-	6	0		Lab Duplicate
N 1062 E 429	-11/9-	24	0		
N 1063 E 300	-11/9-	6	0		
N 1071 E 1100	-11/12-	6		10	
N 1095 E 300	-11/5-	6	0.030189		
N 1100 E 250	-11/5-	6 A	0.001021		
N 1100 E 250	-11/5-	18 A	0.000196		
N 1100 E 300	-11/5-	6	0.002288		

PLM - Polarized Light Microscopy; TEM - Transmission Electron Microscopy

TEM Method detection limit is 0.5 %. PLM detection Limit is 1 %

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Table 2-11. Analytical Results Survey—New Vernon Road

Grid Point	Sampling Date	Depth (inches)	Analytical Technique		Comments
			TEM % Asbestos	PLM % Asbestos	
N 1100 E 350	-11/5-	6	0		Lab Duplicate
N 1100 E 350	-11/5-	6	0		Lab Duplicate
N 1100 E 560	-11/9-	6		< 1	
N 1100 E 560	-11/9-	24	0.335926		
N 1100 E 600	-11/5-	6	0.288803		
N 1100 E 600	-11/9-	6		< 1	
N 1100 E 700	-11/9-	6 A		0	Field Duplicate
N 1100 E 700	-11/9-	6 B		0	Field Duplicate
N 1100 E 700	-11/9-	24 A	0		
N 1100 E 800	-11/6-	6		3	
N 1100 E 900	-11/6-	6		0	
N 1100 E 900	-11/6-	6 A		0	Field Duplicate
N 1100 E 900	-11/6-	6 B		< 1	Field Duplicate
N 1100 E 950	-11/12-	6		5	
N 1100 E 1250	-11/7-	6	0.002542		
N 1100 E 1500	-11/8-	6	0		Lab Duplicate
N 1100 E 1500	-11/8-	6	0		Lab Duplicate
N 1100 E 1500	-11/8-	18	0		Lab Duplicate
N 1100 E 1500	-11/8-	18	0		Lab Duplicate
N 1128 E 800	-11/12-	6 A		10	Field Duplicate
N 1128 E 800	-11/12-	6 B		5	Field Duplicate
N 1140 E 358	-11/6-	18	0.099888		
N 1150 E 207	-11/6-	6 A			Field Duplicate
N 1150 E 207	-11/6-	6 B			Field Duplicate
N 1150 E 207	-11/6-	18 A	0.01145		
N 1150 E 235	-11/9-	6	0		
N 1150 E 250	-11/9-	6	0		
N 1150 E 300	-11/6-	18	0.010848		
N 1150 E 300	-11/6-	6			
N 1150 E 450	-11/7-	6	0.032446		
N 1150 E 500	-11/5-	6	0		
N 1150 E 700	-11/12-	6		< 1	

PLM – Polarized Light Microscopy; TEM – Transmission Electron Microscopy

TEM Method detection limit is 0.5 %. PLM detection Limit is 1 %

Table 2-11. Analytical Results Survey—New Vernon Road

Grid Point	Sampling Date	Depth (Inches)	Analytical Technique		Comments
			TEM % Asbestos	PLM % Asbestos	
N 1150 E 700	-11/12-	24	0		
N 1150 E 800	-11/6-	6		15	
N 1150 E 1550	-11/8-	6	0.001233		
N 1173 E 322	-11/8-	6		< 1	
N 1173 E 322	-11/8-	72	0		
N 1181 E 250	-11/8-	6		5	
N 1190 E 465	-11/7-	6	0		
N 1190 E 465	-11/7-	24	0.000351		
N 1190 E 1165	-11/12-	6		10	
N 1200 E 207	-11/8-	6 A	0.016912		Field Duplicate
N 1200 E 207	-11/8-	6 B	0.001853		Field Duplicate
N 1200 E 207	-11/8-	18 A	0		
N 1200 E 225	-11/13-	6	0.013128		
N 1200 E 250	-11/8-	6		0	
N 1200 E 293	-11/7-	6		< 1	
N 1200 E 293	-11/7-	72	0		
N 1200 E 300	-11/7-	6		0	
N 1200 E 425	-11/7-	6		< 1	Lab Duplicate
N 1200 E 425	-11/7-	6		0	Lab Duplicate
N 1200 E 600	-11/5-	6	0.000244		
N 1200 E 800	-11/6-	6	1.08794		
N 1200 E 1200	-11/7-	6	0.00241		Lab Duplicate
N 1200 E 1200	-11/7-	6	0		Lab Duplicate
N 1200 E 1292	-11/7-	6	0		
N 1224 E 320	-11/13-	6 A		0	Field Duplicate
N 1224 E 320	-11/13-	6 B		0	Field Duplicate
N 1238 E 1000	-11/12-	6		0	Lab Duplicate
N 1238 E 1000	-11/12-	6		0	Lab Duplicate
N 1250 E 208	-11/8-	6	0		
N 1250 E 225	-11/8-	6	0.002724		
N 1250 E 225	-11/8-	24	0.000974		
N 1250 E 250	-11/8-	6		20	Lab Duplicate

PLM – Polarized Light Microscopy; TEM – Transmission Electron Microscopy

TEM Method detection limit is 0.5 %. PLM detection Limit is 1 %

Table 2-11. Analytical Results Survey—New Vernon Road

Grid Point	Sampling Date	Depth (Inches)	Analytical Technique		Comments
			TEM % Asbestos	PLM % Asbestos	
N 1250 E 250	-11/8-	6		5	Lab Duplicate
N 1250 E 300	-11/7-	6	0		
N 1250 E 300	-11/7-	24	0.053087		Lab Duplicate
N 1250 E 300	-11/7-	24	0.000146		Lab Duplicate
N 1250 E 350	-11/6-	6	0		
N 1250 E 390	-11/7-	6	0		
N 1250 E 400	-11/6-	6	0.000481		
N 1250 E 450	-11/7-	6	0		
N 1250 E 450	-11/7-	24	0.000334		
N 1250 E 500	-11/5-	6	0		
N 1250 E 800	-11/12-	6	0		
N 1250 E 900	-11/12-	6		0	
N 1250 E 1550	-11/8-	6	0		
N 1300 E 206	-11/8-	6	0.00077		
N 1300 E 206	-11/8-	18	0		
N 1300 E 225	-11/8-	6	0.00182		
N 1300 E 250	-11/8-	6	0		
N 1300 E 300	-11/6-	6	0		Lab Duplicate
N 1300 E 300	-11/6-	6	0		Lab Duplicate
N 1300 E 300	-11/7-	6	0		Rig
N 1300 E 327	-11/13-	6	0		
N 1300 E 350	-11/6-	6	0		Lab Duplicate
N 1300 E 350	-11/6-	6	0		Lab Duplicate
N 1300 E 400	-11/7-	6	0.017067		
N 1300 E 400	-11/7-	48	0		
N 1300 E 462	-11/7-	6	0.000127		
N 1300 E 600	-11/5-	6	0.000448		Lab Duplicate
N 1300 E 600	-11/5-	6	0		Lab Duplicate
N 1300 E 1100	-11/7-	6	0		
N 1300 E 1200	-11/7-	6	0.000209		
N 1300 E 1200	-11/7-	18	0		
N 1300 E 1300	-11/7-	6	0		

PLM – Polarized Light Microscopy; TEM – Transmission Electron Microscopy

TEM Method detection limit is 0.5 %. PLM detection Limit is 1 %

Table 2-11. Analytical Results Survey—New Vernon Road

Grid Point	Sampling Date	Depth (Inches)	Analytical Technique		Comments
			TEM % Asbestos	PLM % Asbestos	
N 1300 E 1500	-11/8-	6	0		
N 1300 E 1550	-11/8-	6	0		
N 1300 E 1600	-11/8-	6	0		
N 1327 E 379	-11/7-	6	0		
N 1327 E 379	-11/7-	24	0.001345		
N 1338 E 350	-11/7-	6	0		
N 1350 E 210	-11/8-	6	0.00325		
N 1350 E 225	-11/8-	6	0.003841		
N 1350 E 250	-11/8-	6		0	
N 1350 E 300	-11/7-	6	0		
N 1350 E 400	-11/6-	6	0		
N 1350 E 466	-11/7-	6	0		
N 1350 E 466	-11/7-	24	0		
N 1352 E 1300	-11/7-	6	0		
N 1375 E 1100	-11/7-	6	0		
N 1375 E 1200	-11/7-	6	0		
N 1400 E 225	-11/8-	6	0.000471		
N 1400 E 225	-11/8-	24	0		
N 1400 E 250	-11/8-	6	0.001234		
N 1400 E 341	-11/7-	6	0.000741		
N 1400 E 341	-11/7-	24	0		
N 1400 E 419	-11/7-	6	0		
N 1400 E 900	-11/12-	6		0	
N 1400 E 1000	-11/7-	6	0		
N 1410 E 510	-11/7-	6	0.013299		
N 1415 E 231	-11/8-	6	0.002298		
N 1415 E 231	-11/8-	24	0.001940		
N 1419 E 300	-11/7-	6		0	
N 1420 E 450	-11/6-	6	0.000414		
N 1425 E 250	-11/8-	6		<1	
N 1425 E 400	-11/6-	6	0.003126		

PLM - Polarized Light Microscopy; TEM - Transmission Electron Microscopy

TEM Method detection limit is 0.5 %. PLM detection Limit is 1 %

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Table 2-11. Analytical Results Survey—New Vernon Road

Grid Point	Sampling Date	Depth (inches)	Analytical Technique		Comments
			TEM % Asbestos	PLM % Asbestos	
N 1440 E 300	-11/6-	6	0.088587		
N 1445 E 695	-11/7-	6	0		Lab Duplicate
N 1445 E 695	-11/7-	6	0		Lab Duplicate
N 1450 E 250	-11/6-	6		< 1	
N 1450 E 600	-11/7-	6	0		Lab Duplicate
N 1450 E 600	-11/7-	6	0		Lab Duplicate
UNKNOWN - 1	-11/7-	6		20	
UNKNOWN - 2	-11/9-	6		50	Lab Duplicate
UNKNOWN - 2	-11/9-	6		40	Lab Duplicate
UNKNOWN - 3 -	-11/12-	6		0	
Total Number of Analyses			TEM	PLM	
			189	41	

PLM - Polarized Light Microscopy; TEM - Transmission Electron Microscopy
 TEM Method detection limit is 0.5 %. PLM detection Limit is 1 %

samples indicated higher asbestos concentrations, PLM was utilized to determine asbestos concentration. Detection limits for TEM and PLM were 0.5 and 1.0 percent, respectively. Although the detection limits for TEM is 0.5 percent, lower calculated theoretical values are presented in Table 2-11 to better quantify asbestos concentrations. Locations of surface asbestos concentrations are presented in Figure 2-6.

Of the 188 samples, 71, or approximately 38 percent, contained measurable quantities of asbestos. Asbestos concentrations ranged from 0 to 30 percent. Of the 151 surface samples analyzed by TEM, one sample contained asbestos concentrations above the method detection limit of 0.5 percent (1.08794 percent at grid point N1200, E800). Asbestos concentrations of samples analyzed by PLM were higher. Of the 37 surface samples analyzed by PCM, 13 contained asbestos concentrations greater than the method detection limit of 1 percent. Asbestos concentrations ranged from 3 to 30 percent with five samples containing asbestos concentrations greater than 10 percent (grid points N 1000 E 550, N 1037 E 550 and duplicate, N 1150 E 800 and N 1250 E 250).

2.2.3 Subsurface Soils

This section presents the results of the asbestos levels found in subsurface soil samples collected during the field investigation. All subsurface soil samples collected during the National Gypsum RI were collected from 3 test borings. These samples were not analyzed for asbestos.

EPA's contractor collected and analyzed 42 subsurface soil samples during the field investigation. Analytical subsurface soil results are presented in Table 2-11. Of these 42 samples, 25 were collected at a depth of 18 inches and 14 were collected at a depth of 24 inches. One sample, located at grid point N 1300 E 400, was collected at a depth of 48 inches and 2 samples, located at grid points N 1173 E 322 and N 1200 E 293, were collected at a depth of 72 inches.

All subsurface soil samples were analyzed by TEM. Of the 41 samples, 14 or 33 percent contained measurable quantities of asbestos. Only one sample contained an asbestos concentration above method detection limits (1.048996 percent at N1037 E550).

In addition to the chemical analysis performed on the subsurface soil samples, field identification of probable asbestos fill material was performed based on whether the observed material appeared to be native soil or asbestos fill. As previously discussed, this identification was straightforward in the field since the asbestos fill material consisted of tiles, shingles and wallboard slurry. From this visual investigation, locations and thickness of asbestos fill material were determined. This information is presented in Figure 2-7.

The majority of the subsurface asbestos fill was found in the north central portion of the property. This area (approximately 28,000 square yards) contained asbestos at the surface and ranged in thickness from 1 to 8 feet. This fill area contains approximately 13,000 cubic yards

of asbestos fill and represents approximately 80 percent of the total volume of asbestos fill material found on the site. Locations of vertical cross sections in this landfill are indicated on Figure 2-8 and are presented in Figures 2-9, 2-10 and 2-11.

Three smaller areas of asbestos are evident along the access road and northwest corner of the property. These areas are also located near the surface and contain asbestos thicknesses ranging from 0 to 8 feet. Locations of vertical cross sections in these areas are indicated on Figure 2-8 and are presented in Figure 2-11.

Since the thickness and locations of asbestos fill material are based on preliminary field judgements and not laboratory analysis, some material identified in the field as native soil may indeed contain some amount of asbestos. This is especially true for surface soil and sediments bordering the filled debris areas. Therefore, area and volume estimates should be considered minimum estimates since additional asbestos may be present, but may have been identified as native soil or sediment.

2.2.4 Ground Water

Analysis of ground water at the site is limited to the National Gypsum RI. No onsite or offsite ground water samples were collected during EPA's field investigation, as performed by Alliance.

Three onsite ground water samples were collected during the National Gypsum RI. Ground water samples were obtained from monitoring wells located around the perimeter of the main asbestos fill area (see Figure 2-1). It is important to note that no ground water samples were collected in the areas believed to contain saturated asbestos fill. In addition, three off-site ground water sources were sampled and subsequently analyzed. These samples were obtained from potable wells located around the perimeter of the site (see Figure 2-3).

All ground water and potable well samples contained asbestos fiber concentrations below the reported detection limit of 100,000 fibers per liter. The National Primary Drinking Water Regulations (PDWRs) (40 CFR 141.62 revised by 56 FR 3578, January 30, 1991) promulgated a MCL for asbestos of 7,000,000 fibers per liter.

2.2.5 Surface Water

Two surface water samples were collected near the site during the National Gypsum RI. These two samples were collected in drainage ditches, one upgradient (SW-18) and one downgradient (SW-19) of the site. Surface water in these drainage ditches flows from north to south. Surface water run-off from the New Vernon Road Site, particularly over the main asbestos fill area, flows to the swamp located to the east of the site. Approximate surface water sampling locations and the approximate direction of ground water flow which was determined in the National Gypsum RI Report are presented in Figure 2-2. Specific locations of these samples are not included in the National Gypsum RI Report. No surface water samples were collected during EPA's 1990 field investigation, as performed by Alliance.

The asbestos concentration in SW-18 was below the detection limit of 200,000 fibers per liter. This higher detection limit (the majority of the detection limits during asbestos analysis was 100,000 fibers per liter) was used because the sample contained a high amount of particulate matter. Therefore, a 100 milliliter sample was analyzed instead of a 1 liter sample. An asbestos concentration of 3,200,000 fibers per liter was obtained in sample SW-19. Both of these concentration levels are below the PDWRs MCL for asbestos of 7,000,000 fiber per liter.

2.2.6 Sediments

Two sediment samples (SED-13 and SED-14) were collected near the site during the National Gypsum RI. These two samples were collected in the same locations as the surface water samples discussed in Section 2.2.5. Sediment sample locations are presented in Figure 2-2. Sediment samples consisted of a brown silt and sand with high organic content (SED-13) and a sandy silt with brown organic matter (SED-14). No sediment samples were collected during Alliance's 1990 field investigation.

No asbestos concentrations above method detection limits of 0.5 percent for TEM were detected in SED-13 or SED-14.

2.2.7 Air

Ambient air samples were taken and analyzed for asbestos fiber concentrations during the National Gypsum RI and EPA's 1990 field investigation, as performed by Alliance. All air samples were analyzed by PLM using sampling method NIOSH 7400. With this procedure, the detection limit varies with the volume of air sampled. The detection limit for samples collected during the National Gypsum RI was 0.1 fibers/cc. Detection limit ranges for samples collected during Alliance's 1990 field investigation were between 0.0005 to 0.0030 fibers/cc.

During the National Gypsum RI, a total of three air samples (NVR1, NVR2, and NVR3) plus one replicate sample (NVR4) were collected. These samples were collected during drilling activities and test pit excavation operations. The primary objective was to determine if significant amounts of asbestos fibers would be released during any drilling activity that might be undertaken as a remedial action and to predict the air quality impact at the site boundary. Air samples were taken near the locations where the monitoring wells were installed which are presented in Figure 2-1.

Asbestos air concentrations of the four samples were ND, ND, 0.014 and 0.032 fibers/cc in NVR1, NVR2, NVR3 and NVR4, respectively and are presented in Table 2-12.

A total of 33 outdoor air samples were collected during Alliance's field investigation. In addition, 15 field blanks were taken. These samples were collected upwind, downwind and on the site during the operation of field activities. Air sampling locations are presented in Figure 2-12. Asbestos air concentrations ranged from 0 to 0.063 fibers/cc and are presented in Table 2-13.

**TABLE 2-12. SUMMARY OF ASBESTOS AIR SAMPLING RESULTS
NEW VERNON ROAD SITE**

Date	Location	Fibers/cc
9/16/87	NVR1	<.01
9/17/87	NVR2	<.01
9/18/87	NVR3	.014
9/18/87	NVR4 (Dup NVR2)	.032
9/18/87	Trip blank	<.01

*Samples analyzed by Phase Contrast Microscopy (PCM).

Source: Remedial Investigation Report, Asbestos Disposal Sites, Morris County, New Jersey.
Prepared by Fred C. Hart Associates for National Gypsum Company, May 1987.

A91-433.tbl

RECYCLED PAPER

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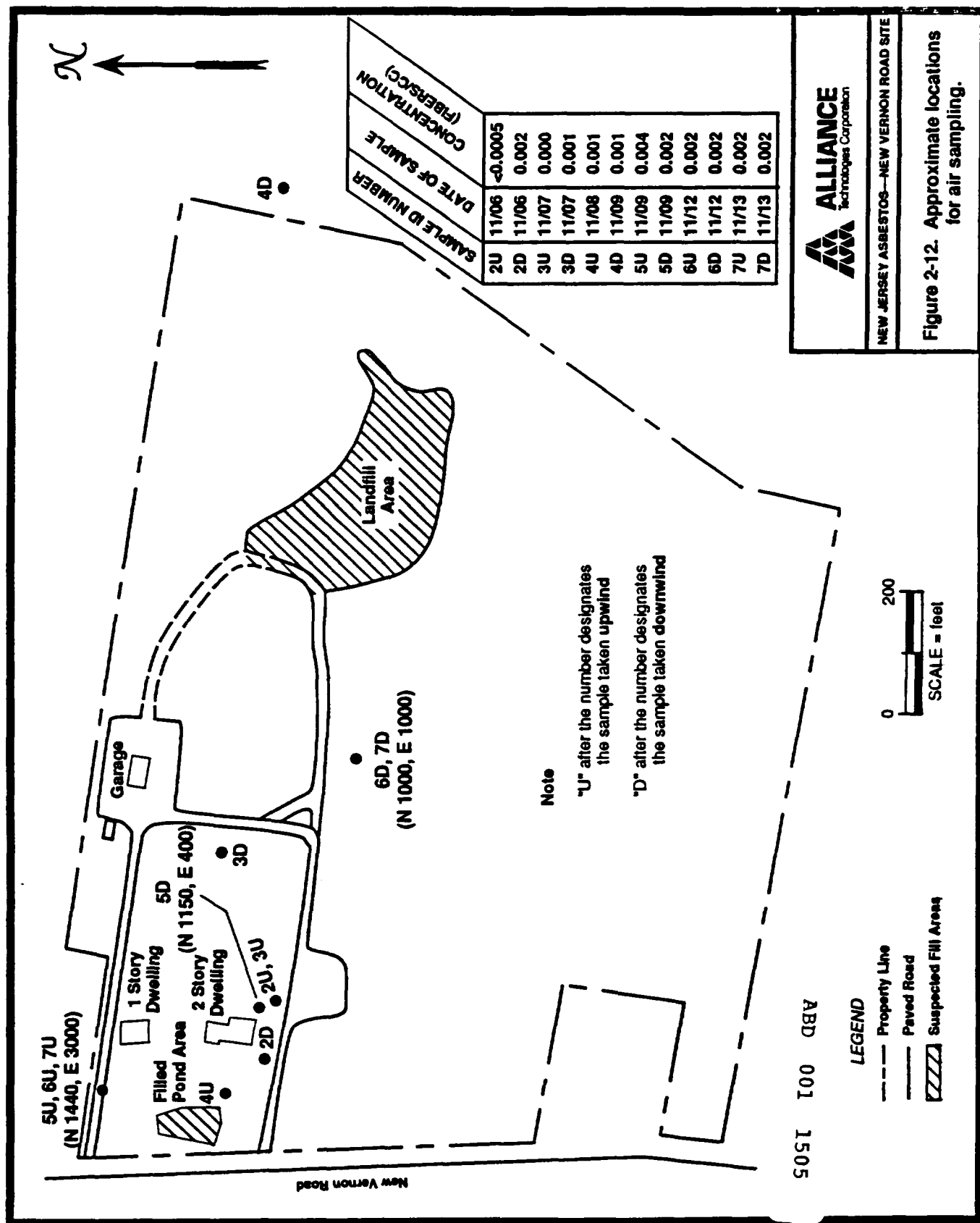


Table 2-13. Air Monitoring Results at the New Vernon Road Site

Date	Type of Sample	Sample I.D.	Sample Location	Sampling Period	Volume Collected (liters)	Fiber Load (per sq. mm)	Concentration (fibers/cc)
Nov. 5	Area	AMB-11/5-UP	Upwind	1135 - 1633	524	2.546	0.002
		AMB-11/5-DN	Downwind	1329 - 1639	1662	3.820	0.001
	Personal	AMB-11/5-01	Rick R.	1335 - 1645	298	0.000	<0.0016
		AMB-11/5-01 (Dup.)	Rick R.	1335 - 1645	298	0.000	<0.0016
		AMB-11/5-FB1	Field Blank	NA	0	0.000	(a)
		AMB-11/5-FB2	Field Blank	NA	0	0.000	(a)
Nov. 6	Area	AMB-11/6-UP	Upwind	0830 - 1730	1080	0.000	<0.0005
		AMB-11/6-DN	Downwind	0830 - 1730	1080	5.093	0.002
	Personal	AMB-11/6-01	Tom L.	1400 - 1700	360	3.820	0.004
		AMB-11/6-02	Rick R.	1400 - 1700	360	14.006	0.015
		AMB-11/6-03	Fred M.	1400 - 1700	360	11.459	0.012
		AMB-11/6-FB1	Field Blank	NA	0	1.273	(a)
		AMB-11/6-FB2	Field Blank	NA	0	0.000	(a)
		AMB-11/6-FB2 (Dup.)	Field Blank	NA	0	11.459	(a)
Nov. 7	Area	AMB-11/7-UP	Upwind	0800 - 1700	1080	1.273	0.000
		AMB-11/7-DN	Downwind	0800 - 1700	1080	3.820	0.001
	Personal	AMB-11/7-01	Lindsey C.	1400 - 1700	360	33.104	0.035
		AMB-11/7-02	Maria D.	1400 - 1700	360	10.186	0.011
		AMB-11/7-02 (Dup.)	Maria D.	1400 - 1700	360	7.639	0.008
		AMB-11/7-FB1	Field Blank	NA	0	1.273	(a)
		AMB-11/7-FB2	Field Blank	NA	0	1.273	(a)
Nov. 8	Area	AMB-11/8-UP	Upwind	0905 - 1719	869	1.273	0.001
		AMB-11/8-DN	Downwind	0830 - 1725	803	1.273	0.001
	Personal	AMB-11/8-01	Rick R.	0949 - 1225			
				1425 - 1720	520	85.723	0.063
		AMB-11/8-01 (Dup.)	Rick R.	0949 - 1225			
				1425 - 1720	520	80.680	0.060
		AMB-11/8-02	Tom L.	0850 - 1205			
				1409 - 1715	480	13.867	0.011
		AMB-11/8-03	Phil M.	0901 - 1200			
				1410 - 1715	622	27.734	0.017
		AMB-11/8-03 (Dup.)	Phil M.	0901 - 1200			
				1410 - 1715	622	30.255	0.019
		AMB-11/8-FB1	Field Blank	NA	0	0.000	(a)
		AMB-11/8-FB2	Field Blank	NA	0	1.273	(a)

(a) Field blanks have no sample volume; results expressed as total fiber load (fibers/sq. mm)

(b) Triplicate analyses of this sample conducted for QC purposes.

Sampling Method: NIOSH 7400; Analytical Method: Phase Contrast Microscopy

Table 2-13. Air Monitoring Results at the New Vernon Road Site

Date	Type of Sample	Sample I.D.	Sample Location	Sampling Period	Volume Collected (liters)	Fiber Load (per sq. mm)	Concentration (fibers/cc)
Nov. 5	Area	AMB-11/5-UP	Upwind	1135 - 1633	524	2.546	0.002
		AMB-11/5-DN	Downwind	1329 - 1639	1662	3.820	0.001
	Personal	AMB-11/5-01	Rick R.	1335 - 1645	298	0.000	<0.0016
		AMB-11/5-01 (Dup.)	Rick R.	1335 - 1645	298	0.000	<0.0016
		AMB-11/5-FB1	Field Blank	NA	0	0.000	(a)
		AMB-11/5-FB2	Field Blank	NA	0	0.000	(a)
Nov. 6	Area	AMB-11/6-UP	Upwind	0830 - 1730	1080	0.000	<0.0005
		AMB-11/6-DN	Downwind	0830 - 1730	1080	5.093	0.002
	Personal	AMB-11/6-01	Tom L.	1400 - 1700	360	3.820	0.004
		AMB-11/6-02	Rick R.	1400 - 1700	360	14.006	0.015
		AMB-11/6-03	Fred M.	1400 - 1700	360	11.459	0.012
		AMB-11/6-FB1	Field Blank	NA	0	1.273	(a)
		AMB-11/6-FB2	Field Blank	NA	0	0.000	(a)
		AMB-11/6-FB2 (Dup.)	Field Blank	NA	0	11.459	(a)
Nov. 7	Area	AMB-11/7-UP	Upwind	0800 - 1700	1080	1.273	0.000
		AMB-11/7-DN	Downwind	0800 - 1700	1080	3.820	0.001
	Personal	AMB-11/7-01	Lindsey C.	1400 - 1700	360	33.104	0.035
		AMB-11/7-02	Maria D.	1400 - 1700	360	10.186	0.011
		AMB-11/7-02 (Dup.)	Maria D.	1400 - 1700	360	7.639	0.008
		AMB-11/7-FB1	Field Blank	NA	0	1.273	(a)
		AMB-11/7-FB2	Field Blank	NA	0	1.273	(a)
Nov. 8	Area	AMB-11/8-UP	Upwind	0905 - 1719	869	1.273	0.001
		AMB-11/8-DN	Downwind	0830 - 1725	803	1.273	0.001
	Personal	AMB-11/8-01	Rick R.	0949 - 1225			
				1425 - 1720	520	85.723	0.063
		AMB-11/8-01 (Dup.)	Rick R.	0949 - 1225			
				1425 - 1720	520	80.680	0.060
		AMB-11/8-02	Tom L.	0850 - 1205			
				1409 - 1715	480	13.867	0.011
		AMB-11/8-03	Phil M.	0901 - 1200			
				1410 - 1715	622	27.734	0.017
		AMB-11/8-03 (Dup.)	Phil M.	0901 - 1200			
				1410 - 1715	622	30.255	0.019
		AMB-11/8-FB1	Field Blank	NA	0	0.000	(a)
		AMB-11/8-FB2	Field Blank	NA	0	1.273	(a)

(a) Field blanks have no sample volume; results expressed as total fiber load (fibers/sq. mm)

(b) Triplicate analyses of this sample conducted for QC purposes.

Sampling Method: NIOSH 7400; Analytical Method: Phase Contrast Microscopy

ABD 001 1507

Table 2-13. Air Monitoring Results at the New Vernon Road Site

Date	Type of Sample	Sample I.D.	Sample Location	Sampling Period	Volume Collected (liters)	Fiber Load (per sq. mm)	Concentration (fibers/cc)
Nov. 9	Area	AMB-11/9-UP	Upwind	1000 - 1345	396	3.820	0.004
		AMB-11/9-DN	Downwind	1000 - 1355	325.5	1.273	0.002
	Personal	AMB-11/9-01	Phil M.	0955 - 1100	102	1.273	0.005 (b)
		AMB-11/9-01 (Dup.)	Phil M.	0955 - 1100	102	2.546	0.010
		AMB-11/9-FB1	Field Blank	NA	0	1.273	(a)
		AMB-11/9-FB2	Field Blank	NA	0	0.000	(a)
Nov. 1	Area	AMB-11/12-UP	Upwind	0955 - 1643	726.2	3.820	0.002
		AMB-11/12-DN	Downwind	000 - 1163	670	3.820	0.002
	Personal	AMB-11/12-01	Rick R.	1112 - 1321			
				1420 - 1626	436	17.649	0.016 (b)
		AMB-11/12-01 (Dup.)	Rick R.	1112 - 1321			
				1420 - 1626	436	15.128	0.013
						7.639	0.007
		AMB-11/12-FB1	Field Blank	NA	0	0.000	(a)
		AMB-11/12-FB2	Field Blank	NA	0	0.000	(a)
	Area	AMB-11/13-UP	Upwind	1026 - 1637	649	3.820	0.002
Nov. 1	Personal	AMB-11/13-DN	Downwind	1031 - 1645	632	2.546	0.002
		AMB-11/13-01	Rick R.	1043 - 1220	166	5.093	0.012
		AMB-11/13-01 (Dup.)	Rick R.	1043 - 1220	166		0.009
		AMB-11/13-FB1	Field Blank	NA	0	0.000	(a)
		AMB-11/13-FB2	Field Blank	NA	0	0.000	(a)

(a) Field blanks have no sample volume; results expressed as total fiber load (fibers/sq. mm)

(b) Triplicate analyses of this sample conducted for QC purposes.

Sampling Method: NIOSH 7400; Analytical Method: Phase Contrast Microscopy

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